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The Students' Quiz Series.

PRACTICE OF MEDICINE.

A MANUAL FOR STUDENTS AND PRACTITIONERS.

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PREFACE.

THIS volume is only intended to embody briefly the main facts known in regard to the diseases treated of.

It is a compilation from various authors, and has been written in the form of question and answer for the convenience of students.

Theories regarding the origin of diseases have been avoided as much as possible, and none but English words have been used where it was possible to avoid the foreign equivalent.

The principal authorities consulted are Fagge, Charcot, Strümpfel, Niemeyer, Bennett, Flint, Delafield, Gowers, and various hospital reports.

E. T. DOUBLEDAY,
J. DARWIN NAGEL.

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PRACTICE OF MEDICINE.

INFECTIOUS DISEASES.

What are infectious diseases?

Diseases in which the morbid condition is produced by a poison taken into the body from without.

What are the varieties of infectious diseases?

(1) Miasmatic, when the micro-organism lives and grows outside of the body, and is taken in by prolonged contact; (2) contagious, when the micro-organism lives within the body, and is eliminated in a form to affect other bodies; (3) unclassified cases, when the micro-organism can live either within or without the body.

Give the varieties of infectious diseases according to their appearance.

(1) Sporadic, cases which occur in an isolated and scattered manner; (2) endemic, cases which appear to be confined to certain localities; (3) epidemic, cases which attack many individuals suddenly, and when the disease rapidly spreads to other localities.

How can contagion be transmitted?

Through inoculation or contact (syphilis, gonorrhœa), through the surrounding atmosphere (typhus), by means of articles of clothing (scarlatina), through food or water (typhoid), through excreta (tuberculosis), or by means of other infected bodies.

What does the degree of contagiousness depend upon?

On the strength of poison, mode of application, constitution and state of health of the individual, hygienic surroundings, climate, season of the year, and locality.

What is the nature of a contagium?

Each infectious disease is supposed to have its separate morbific agent or poison. This poison is capable of propagating and exciting this one disease, and no other. This specific poison is called contagium, virus, ferment, or micro-organism.

What are the modes in which infectious diseases manifest themselves?

By local and superficial disturbances (gonorrhœa); by local, followed by constitutional, disturbance (syphilis); by general disturbance, followed by local lesions (typhoid).

What measures should be taken to prevent and limit the spread of infectious diseases?

Isolation of patient, proper ventilation of the room in which the patient is confined, removal from the room of all articles not absolutely necessary; and thorough disinfection of the room and all articles which may have been brought in contact with the patient.

TYPHOID FEVER.

What is typhoid fever?

An infectious disease whose special characteristics are lesions in the lymphatic glands of the intestines, mesentery, and spleen, and a roseolar eruption on the abdomen or chest.

What is the cause of typhoid fever?

A specific, organized, pathogenic poison, appearing as a short rod-shaped bacillus with ends rounded off, generally found in colonies (foci) and multiplying by spores. The bacilli are propagated through sewer-gas, drinking-water, food, and dejections. The germs are introduced through the alimentary canal. Bacillus of Eberth.

When is typhoid fever most common as regards age and time of year?

Between the ages of fifteen and thirty-five years, and during the months of August to November.

Give the pathological changes of typhoid fever?

In the intestines Peyer's patches and the solitary glands are first enlarged and swollen, from irritation and inflammation caused by deposits of the typhoid virus. On the ninth or tenth day the infected glands ulcerate. If the case progresses favorably, they begin to cicatrize about the twenty-first day. The process of cicatrization generally lasts about two weeks.

What are the most serious dangers to be feared from typhoidal intestinal ulcerations?

Extensive sloughing of the infected glands, causing septic general peritonitis or hemorrhage into the peritoneal cavity.

Give the general course of the stage of incubation.

It lasts two to three weeks; symptoms are very indefinite; the patient has anorexia, headache (generally frontal), general pains, chilly sensa-

tions, and a feeling of languor. Occasionally he also has nausea, slight epistaxis, and slight fever.

What are the symptoms of the stage of development?

The above symptoms increase rapidly in severity; the skin is hot and dry, thirst is marked, and the evening temperature rises progressively; the tongue is dry, and shows a brown or dark-yellow coating on both sides of the median line, pulse is accelerated and generally small and soft, the area of splenic dulness is increased, and there may be gurgling and tenderness over the abdomen on pressure, particularly in the right iliac fossa. Tympanites is often observed. Epistaxis and bronchial catarrh are frequently present. Diarrhœa or constipation may exist.

Give the symptoms of the active stage of the fever.

This stage lasts through the second, and sometimes through the third, week. Fever is from 102°–104° F.; generally coma or delirium is present; slight bronchitis; abdomen somewhat swollen and tympanitic; generally more or less tenderness in the right iliac region exists; also in most cases a number of small pale-red isolated spots appear (size of a flea-bite). These increase in number, but for the first twenty-four hours disappear temporarily on pressure. The pulse is soft, frequent, and often dicrotic.

Give the symptoms of the stage of decline.

In simple cases this stage begins at the end of the third week. The fever declines, the greatest fall being in the successive morning temperature. General symptoms decrease, and the patient's convalescence begins.

What are the most frequent complications and sequelæ of typhoid fever?

Inflammation of the peritoneum from perforation, caused by sloughing intestinal ulcers, and of the mesenteric glands or vermiform appendix; sometimes also by softening and rupture of the spleen. Inflammation of the parotid, sublingual, or cervical glands. Nephritis, cystitis, orchitis, broncho-pneumonia, or inflammation of the membranes of the brain also occurs. Phlebitis of the saphenous, popliteal, or other veins of the extremities, and also suppurative inflammation of the middle ear or the larger joints, are frequently seen.

For what diseases would typhoid fever be most liable to be mistaken?

The various forms of malarial fever, tuberculosis, meningitis, pneumonia in old people, or central pneumonia.

What is the prognosis of typhoid fever?

Perfectly favorable *prognosis* can never be given. It depends on the severity of the infection, the constitution of the patient, and on the complications. The average number of deaths is about 10 per cent.

What is the treatment of typhoid?

A specific *treatment* for typhoid is unknown. It is mostly symptomatic. The sick-room should be well aired. Diet should be liquid, consisting chiefly of milk. Some give meat broths and beef tea from the middle of the second week on, and stimulants should be given as called for by the condition of the patient's pulse. Cold water or cold tea may be given in large quantities. The treatment by cold baths is frequently employed. The patient is put in a bath of 90° F., which is cooled gradually to 73° F. This may be done three or four times a day, as necessary. Great weakness or severe complications, as peritonitis, contraindicate this treatment. Sponging with alcohol or wrapping in a wet sheet is frequently employed to reduce the fever.

The drugs most frequently used are naphthaline, antipyrine, the salicylates, bismuth, muriatic acid, and minute doses of calomel. These drugs are used either for their antipyretic or antiseptic action. For weak heart alcohol, digitalis, and strychnine are given. In hemorrhage and peritonitis ice over the abdomen, the cold coil, and internally opium and other astringents and narcotics. For diarrhœa the astringents, either by the mouth or by the rectum. Great care should be taken to disinfect all vessels used by the patient, the clothing, bedding, and excreta.

TYPHUS.

What is typhus fever?

A continued fever running a definite course, attended with great prostration of the nervous and vascular systems, and characterized by a distinct macular eruption.

Give its etiology.

It is generated by a specific poison whose nature is unknown. It is directly contagious.

The predisposing *causes* are—a low physical condition of the organism, overcrowding, and want of cleanliness. It is most common between the ages of twenty and forty years.

What are the pathological changes?

The blood is clotted, serum exudes into the cavities, the body decomposes rapidly, maculæ persist, the voluntary muscles are softened, the membranes of the brain are inflamed, and the internal organs are congested.

Describe the stage of incubation and invasion.

The stage of incubation lasts from nine to twelve days. There may be chilliness, restlessness, and general malaise. The stage of invasion is generally sudden. There is pronounced rigor, marked depression and exhaustion; violent muscular pains; sometimes vertigo, stupor, and de-

lirium. The temperature rapidly rises, often reaching 106° F. It is generally constant, with slight morning remissions. The skin is generally hot and dry; there is catarrh of the bronchial and nasal mucous membranes. The urine is scanty and high-colored, and the pulse is soft, frequent, and compressible, and sometimes dicrotic.

Describe the stage of eruption.

This lasts from the third to the seventh day. The eruption is either a subcuticular mottling or distinct maculæ, which appear first on the back of the wrist and epigastrium, and persists to the end of the period of eruption. The spots are distinct, irregularly rounded, superficial; at first pinkish, then darkish in color. At first they disappear on pressure. These spots disappear from the fourteenth to the twenty-first day of the disease. During the period of eruption all general symptoms increase in severity; prostration is very marked and the urine becomes albuminous.

What are the symptoms of the stage of decline?

All constitutional symptoms suddenly decrease on the fourteenth or twenty-first day of the disease. Temperature falls, the skin becomes moist, the tongue loses its dry appearance, delirium ceases, and convalescence begins.

What are the complications and sequelæ?

The *complications* are those of infective fever; *sequelæ* are rare.

What is the prognosis?

Prognosis is generally favorable, as the mortality is only 1 in 15, and relapses are rare. Coma, cardiac failure, extreme prostration, very high fever, severe cerebral symptoms, suppression of urine, and abundant eruption are generally indications of a fatal termination.

What is the treatment?

Treatment should be symptomatic, as no remedy is known to cut short the disease. Also extreme care should be taken to let the patient have an abundance of fresh air.

RELAPSING FEVER.

What is relapsing fever?

An acute specific disease of a very infectious nature.

Give its etiology. Spirillum of Obermeier.

It is caused by a micro-organism, which is a spirillum of a thread-like form, and which is found only in the blood at the time of the febrile paroxysms. Predisposing causes of the disease are overcrowding, want of cleanliness, and insufficient food. Men are more frequently attacked than women. It is most common between the ages of twenty and forty.

What are the pathological changes?

There are no characteristic changes.

What is the stage of incubation?

From five to eight days. Prodromal symptoms are exceptional.

What are the symptoms of the stage of invasion?

There is a sudden chill, violent headache, great lassitude, total loss of appetite, marked pains in the extremities, a rapidly-rising temperature, often reaching 106° F., a hot and dry skin, a dry and thickly-coated tongue, and the skin is of a peculiar yellow hue.

Give the symptoms of the height of the disease.

All the *symptoms* of the stage of invasion, except the temperature, increase in severity. The spleen and liver are found enlarged on percussion. The pulse is very quick and thready, and there is marked hyperæsthesia of the muscles. These symptoms last from five days to a week.

Give the symptoms of the stage of decline.

The temperature lessens, attended with profuse sweating; general symptoms grow less, and patient improves rapidly.

What is the further course of the disease?

In from five to seven days a second attack similar to the previous one occurs. Often afterward there is a third attack, and during the interval the objective symptoms disappear, with the exception of the persistence of the splenic tumor.

What is the prognosis?

The majority of cases recover, unless complications occur. The mortality is 1 in 20. The most common complications are affections of the eye. Jaundice is generally a fatal symptom.

What is the treatment?

Treatment is mainly symptomatic. Antipyretics are needless. Good nursing and proper food are the principal things to be regarded.

From what should relapsing fever be differentiated?

Cerebro-spinal meningitis, typhoid fever, typhus, acute miliary tuberculosis, pernicious malarial fever, yellow fever.

SCARLET FEVER (SCARLATINA).

Syn.—Scarlatina; Red rash.

What is scarlet fever?

An acute disease characterized by a peculiar eruption appearing on the skin and the mucous membrane of the bronchi and throat.

What is the cause?

Infection occurs by direct contact with the poison. The specific poison is unknown, but the virus keeps it power for many months. The disease occurs most frequently between the ages of two and ten years.

What are the period and symptoms of incubation?

Period of incubation is from four to seven days; prodromata are not marked.

What are the symptoms of the period of invasion?

It begins with a sudden chill and rapid rise of temperature, difficulty in swallowing, or a feeling of stiffness in the throat. If the patient is young, there is usually vomiting of a projectile character, and marked cerebral symptoms, such as disturbed sleep or delirium and convulsions.

What are the symptoms of the stage of eruption?

The cerebral disturbance increases; temperature rises to 103°–105° F., and at the end of the first twenty-four hours an eruption appears on the neck, face, and chest. This eruption consists of numberless small red points, crowded together, which soon unite into a general diffuse, scarlet-colored erythema. This disappears on firm pressure during the first twelve hours of its appearance. The inflammation of the throat increases, and the typical eruption is generally seen on the roof of the mouth and in the pharynx. The tonsils and cervical glands are enlarged and painful. The rash extends over the after parts of the body, persisting for three or four days, during which time the general symptoms continue severe.

Describe the stage of defervescence.

Eruption begins to fade on the portions of the body where it first appeared, at the end of the first or the beginning of the second week. The rash disappears, and the epidermis exfoliates in shreds. Convalescence is usually slow.

What are the most frequent complications and sequelæ?

The swelling of the throat often takes on a croupous character. Parenchymatous nephritis frequently occurs at the end of the second week or subsequently. Abscess of the cervical lymphatic glands or of the parotid gland is also a frequent complication; suppurative inflammation of the middle ear and purulent rhinitis also occur. Pneumonia, pleurisy, and endocarditis are less frequent sequelæ.

What are the variations seen from the typical eruption?

Eruption may first appear in a papular, vesicular, or hemorrhagic form or resembling the eruption of measles.

From what should scarlet fever be diagnosticated?

From the infectious diseases attended by eruption, such as typhoid, measles, and chicken-pox, and from the eruptions caused by irritant food or drugs.

What is the prognosis?

Prognosis is always uncertain, as complications are common and liable to occur at any time; the disease is most fatal in very young children and adults. Prognosis also depends on the prevailing type of the disease.

What is the treatment?

In ordinary cases give liquid diet; keep the room cool; keep the skin and mouth clean; the skin should also be greased by some form of fat; the patient should wear flannels. For the sore throat a simple gargle or carbolic-acid spray may be used. Abscesses should be immediately opened when pus forms, and treated on general surgical principles. For the nephritic complications alkalies and a large amount of fluid by the mouth may be given. No form of treatment to cut short the fever (of any value) is known. The patient must be kept in bed for at least ten days after all symptoms subside. For otitis the ear should be syringed frequently with boracic-acid solution. Antipyretics for the fever and hypnotics for the restlessness should be used as indicated.

MEASLES.

Syn.—Rubeola; Morbilli.

What is measles?

An exanthematous disease of a comparatively benign nature, characterized by a peculiar eruption of extreme infectiousness.

What is the etiology of measles?

It is caused by a specific poison the details of whose transmission are unknown. It is very contagious and occurs in epidemics.

Describe the stage of incubation.

There are no special prodromata of this stage, but it is supposed to last for about ten days. There may be slight elevations of temperature during this period.

Describe the period of invasion.

Temperature suddenly rises to 102–104° F.; there is marked coryza, with abundant nasal secretion; more or less conjunctivitis and catarrh of the upper portion of the respiratory tract. There is also mild headache, restlessness, loss of appetite, and sometimes mild sore throat. This lasts from three to four days.

Describe the period of eruption.

The mucous membrane covering the hard and soft palate is reddened.

The eruption generally begins on some portion of the face, and rapidly spreads over the entire body. It frequently appears in all parts in thirty-six hours. The eruption consists of papular spots about the size of the head of a pin, surrounded by a pale-red, slightly elevated border; the spots often become confluent and assume a crescentic form, with limited portions of normal skin intervening between the patches of eruption. With the appearance of the eruption the temperature generally rises somewhat, and the catarrhal symptoms persist.

Describe the stage of defervescence.

In from two to three days after the appearance of the eruption there is usually a rapid decline of temperature. The eruption begins to fade and the catarrhal symptoms diminish. Desquamation begins to take place in small scales. If no complications occur, convalescence goes on progressively.

What variations occur in the typical form of eruption?

The spots may remain entirely separate and distinct, or they may become as confluent as in scarlatina. The eruption may assume a vesicular form or become hemorrhagic (black measles).

What are the complications?

Complications are generally exaggerations of the normal symptoms: serious eye disease, otitis media, marked inflammation of the throat, nose, or larynx may appear. A mild bronchitis frequently takes a severe form or results in broncho-pneumonia at the height of the disease or during convalescence. Dysentery and nephritis occasionally occur as complications. Pertussis, or tuberculosis in those who have the predisposition, are frequent sequelæ.

From what should measles be diagnosticated?

From rötheln, scarlet fever, typhus, chicken-pox, small-pox, the eruption of syphilis when attended with fever, and the eruptions caused by various drugs.

What are the prognosis and treatment?

Prognosis is very favorable, but will depend greatly on the absence of pulmonary complications. The *treatment* is symptomatic. Patients should be kept in a darkened room on account of photophobia; the eyes, nose, and mouth should be frequently washed with boric-acid solutions; for severe eye trouble an ointment of yellow oxide of mercury is best; cocaine spray for the hacking cough. The treatment of croupous and pulmonary complications is that generally employed in these diseases. Sponging the patient with lukewarm water and greasing the skin add to his comfort. Especial care should be taken to keep those affected with tubercular or pulmonary complications away from the patient.

ROSEOLA.

Syn.—German measles; False measles.

What is roseola?

A disease characterized by an eruption somewhat similar to measles, and attended with slight constitutional symptoms.

Describe the course of the disease.

The period of incubation lasts ~~two to three weeks~~. After a period of fever lasting a few hours the eruption appears. Fever is always slight: the eruption consists of circular pale-red slightly elevated spots, somewhat smaller than those of measles, and the spots are not apt to become confluent. The soft palate is inflamed at the beginning. There is usually no desquamation; occasionally there is slight catarrh of the mucous membranes, similar to that of measles. Complications and sequelæ are rare.

What are the prognosis and treatment?

Prognosis is favorable. *Treatment* is similar to that of measles.

SMALL-POX.

Syn.—Variola.

What is small-pox?

An acute infectious disease, characterized by a peculiar eruption, which is general all over the body, and by a marked febrile movement.

What is the etiolgy?

The specific organism is unknown. Before the discovery of vaccination the mortality was much greater than at present. Predisposition is universal, but is diminished by vaccination. The mode of transmission is uncertain. The poison apparently exists in the blood, in the contents of the eruption, in the scabs, in the excretions, and the exhalations.

Describe the stage of incubation.

It lasts from ten to fourteen days; prodromal symptoms are slight or absent.

Describe the stage of invasion.

It is ushered in suddenly with a rigor, fever, headache, intense pain in the back, and the temperature rises rapidly, often reaching 104° F. The constitutional symptoms are generally severe: there may be dry tongue, stupor, or delirium, quick pulse, vomiting sometimes of a projectile character, diarrhœa, marked enlargement of the spleen, and albuminous urine.

Describe the stage of eruption.

On the second or third day after invasion the initial eruption appears, which is either as a diffuse or macular erythema or a hemorrhagic erup-

tion upon the hypogastrium and inner surface of the thighs. This lasts for three days; then the temperature generally falls and the characteristic eruption appears. It begins on the face and scalp, afterward extending to the trunk and arms, and lastly the legs. This regular eruption is papular in form, feeling like small shot under the skin, and on the second day after the appearance of the papules a vesicle forms upon their points. The vesicle grows larger, and by the sixth day becomes umbilicated; this becomes pustular on the eighth or ninth day. On its top the pustule presents a slight depression surrounded by a red border. With the eruption on the skin analogous signs develop along the mucous tract, but the eruption upon the mucous membranes rapidly takes on an ulcerative form. With the appearance of the eruption all constitutional symptoms abate somewhat, but with the appearance of suppuration the fever again rises and delirium often develops. On the twelfth to the thirteenth day the pustules dry up, yellow scabs form, the swelling of the skin subsides, and the local skin exhales a characteristic odor, and constitutional symptoms gradually disappear and convalescence begins. Where the skin has been destroyed the characteristic scars are left.

What are the varieties of small-pox?

In very mild cases the symptoms are very obscure; in other classes of cases these suppurative papules may be so near together as to give the skin the appearance of a continuous area of suppuration (confluent form). Occasionally the papules are hemorrhagic, with abundant ecchymoses in the skin and mucous membranes (black small-pox). A few cases develop general hemorrhages in the initial stage. These cases are always followed by quick death.

What is the differential diagnosis?

It should be differentiated from typhus, the papular form of measles, syphilis, and the exudative erythemata.

What is the prognosis?

During the initial stage it is uncertain. If the first symptoms are mild, *prognosis* is favorable. Age, constitution, and alcoholic habits have marked influence. The confluent variety is generally, and the hemorrhage variety is almost invariably, fatal. Mortality averages about 1 in 3, and death usually takes place between the eighth and the thirteenth days.

What is the treatment as regards prophylaxis?

Vaccination, isolation, and disinfection.

What is vaccination?

Inoculation with humanized vaccine virus. The operation is performed by making a few incisions in or scraping off a small bit of the integument,

and introducing the lymph. On the third or fourth day after this the spot and the surrounding tissue become red and swollen. On the seventh or eighth day vaccine vesicles become well developed on the spot of inoculation. They become purulent in a few days; then dry up, leaving a scar behind.

Revaccination should be performed every fifth or sixth year.

What is the treatment?

Treatment is purely symptomatic. For the fever, cool baths and sponging; for headache or delirium, hypnotics and ice-bag; for the pustular eruption, antiseptic pastes and covering the face with a mask and the hands with gloves. Applications made to the skin should be frequently changed. For the eruption on the mucous membranes cooling and disinfectant lotions should be frequently used. Violent nervous symptoms always require the constant use of narcotics.

What are the complications and sequelæ?

Œdema of the glottis, pneumonia, pleurisy, pericarditis, or the various forms of endocarditis have been observed. A suppurative tonsillitis and suppurative inflammation of the salivary and cervical lymphatic glands occasionally occur. Erysipelas is not infrequent. Ophthalmitis, sometimes resulting in permanent blindness, is not very infrequent; occasionally orchitis, ovaritis, acute nephritis, or inflammation of the synovial membranes of the joints, attended with serous or purulent exudation, occur. Disseminated myelitis occasionally follows the disease. Multiple subcutaneous abcesses, either as a complication or sequela, are not infrequent.

VARIOLOID.

What is varioloid?

A milder form of variola, which is most often observed in those whose susceptibility to the poison has been diminished by vaccination.

What is the difference between the courses of varioloid and variola?

In varioloid the primary fever is less; the number of pocks is smaller; the course of the eruption is shortened and modified; the eruption is irregular and often begins on the trunk; the pocks often undergo resolution before reaching a pustular stage; and pitting is slight or absent. General symptoms are not severe, secondary fever is absent, and desiccation may begin on the eighth or tenth day.

What is the treatment?

The *treatment* is the same as for small-pox; grave complications are exceptional.

VARICELLA.

Syn.—Chicken-pox.

What is varicella?

A disease generally occurring in children, characterized by a definite course and a peculiar vesicular eruption. The disease is contagious and epidemic.

Describe the appearance of the eruption.

The eruption consists of smooth, transparent, lenticular, or irregular vesicles, appearing generally on the face or trunk. The vesicles generally disappear without pustulation.

Describe the course of the disease.

The stage of incubation lasts from thirteen to seventeen days; there is then a chilly sensation when the eruption begins to appear; there is generally full development of the eruption by the end of thirty-six hours. On the appearance of the eruption there is fever, but generally constitutional symptoms are slight. Coryza is frequently present. In a few days the vesicles heal very rapidly, and complications are rare.

What are the prognosis and treatment?

Prognosis is favorable. *Treatment* for the disease is unnecessary, except general precautions as to exposure to draughts.

ERYSIPELAS.

What is erysipelas?

An inflammation of the skin excited by the presence of a specific micrococcus (Fehleisen), and recognized by redness, swelling, and pain of the affected parts, and also by its spreading gradually and distinctly by direct extension.

What is its etiology?

A form regarded as belonging to the province of medicine is generally called idiopathic. It is supposed that the micrococcus must have a primary point of entrance. The disease generally manifests itself on the forehead or scalp, and usually starts at the junction and spreads from there to the face. The characteristic micro-organism is a chain-forming micrococcus. The disease is most frequent in adults, and is seen oftener in women than in men. Direct contagion seems exceptional. One attack apparently predisposes toward others.

What is the course of the disease?

Slight rigors and sudden slight or great elevation of temperature, anorexia, headache, or a feeling of fulness in the head. These symptoms are often attended with sore throat. A circumscribed red spot appears on the skin, which is somewhat elevated; this is swollen,

smooth, shiny, and red; it rapidly extends at various points of the circumference of the inflamed area. There is a marked line of demarcation between the healthy and the infected tissues. This process rarely invades the trunk. When the spreading process ceases, the inflammatory process becomes milder and stops. Sometimes vesicles or bullæ form on the skin involved; rarely the infected tissues become gangrenous. Much branny desquamation follows the subsidence of the disease. The inflammation generally lasts one week, but is often protracted. The attack is frequently preceded by gastric or intestinal derangements.

What are the complications and varieties? and what is the diagnosis?

Local *complications*, with the exception of inflammation of the nasal and conjunctival membranes, are rare: other complications which may occur are bronchitis, pneumonia, and pleurisy, and in young adults endocarditis, arthritis, herpes, and urticaria frequently occur. Meningitis may occur in any case from extension of the inflammation. As regards *varieties* of medical erysipelas, various authors divide it, according to the character of the disease, into simple, miliary, œdematous, and gangrenous.

It should be *diagnosed* from lymphangitis, cellulitis, acute eczema, scarlet fever, the acute roseola of syphilis, eruptions from drugs, rhus-poisoning, shingles (facial).

What are the prognosis and treatment?

The *prognosis* in healthy persons is favorable. It depends greatly also on the age of the patient. Alcoholics give an unfavorable prognosis.

The *treatment* is mainly directed to supporting the vital forces of the patient and reducing the discomfort caused by the inflammation of the diseased parts. Locally, the inflamed parts can be sprinkled with powdered starch or smeared with a coating of vaseline, carbolized oil, or olive oil. A coating of collodion, mixed with various antiseptic drugs, has often been of benefit. The application of resorcin ointment is followed by good results. For the fever, cold sponging or cold baths, but the antipyretics are rarely necessary. For internal treatment camphor and the tincture of chloride of iron are frequently used, and the heart should be carefully watched, and its action kept up by digitalis, strychnine, and stimulants in proper doses. In patients past middle life constipation is to be avoided.

DIPHTHERIA.

What is diphtheria?

An acute infectious disease, characterized by an inflammation of the pharynx, posterior portion of the mouth, the upper air-passages, and the formation of a false membrane which extends into their tissues.

What is the etiology?

The contagion is believed to be associated only with the false membrane, but probably it is given off also in the breath. Direct contact predisposes to the disease. The poison has great tenacity. The disease is most frequent between the ages of two and seven years, but is occasionally met with up to adult life. Unhygienic surroundings form a favorable soil for the propagation and preservation of the virus. It is undecided whether the infection is first local and then constitutional, or *vice versa.*

What is the pathology?

The disease is distinguished by the formation of a grayish-white, firm, elastic membrane, appearing as a fibrinous exudation over the infected parts. This can occasionally be easily lifted off, but generally it clings tightly to the mucous membrane, leaving a new bleeding surface when attempted removal is made. Microscopical examination shows it to be a firmly-organized membrane in which there are many colonies of micro-organisms.

What are the course and symptoms of the disease?

The period of incubation is generally brief, lasting from two to five days. The invasion begins with general malaise and headache, a temperature of 100°–102° F., pain on swallowing, and deep redness of the soft palate, tonsils, and fauces. The tonsils are swollen, and upon their inner surface and that of the soft palate, uvula, or fauces small gray spots of membrane appear. In severe cases this membrane spreads in a few hours. Over these parts there is considerable swelling, and also of the lymphatic glands around the jaw. The fever, as a rule, rapidly increases, and general symptoms of severe sickness, such as great prostration, total anorexia, and a rapid, full, and compressible pulse, become marked. If the case is a severe one, the patient's countenance has a peculiar drawn, pallid appearance. In ordinary cases these symptoms persist for from seven to ten days, when the fever subsides, general symptoms decrease, the membrane is exfoliated, and convalescence begins. At the beginning there is generally coryza or slight laryngitis, with the development of a harsh croupy cough. Restlessness is marked, and more or less dyspnœa supervenes from blocking up of the air-passages, or partial paralysis of the laryngeal muscles, caused by the false membrane. As a rule, the dyspnœa increases as the disease progresses, unless portions of the membrane are expectorated or swallowed. If this does not occur, in children or young persons coma or mild convulsions, followed by death, generally rapidly supervene. In some cases the fever never reaches a high point. The patient shows signs of general weakness, followed by coma and death, and the cough and dyspnœa are not marked. This type of the disease is often accompanied by the continuous flow of a fœtid greenish liquid from the mouth or nasal passages. In some cases dyspnœa is not marked. The patient is unable to breathe

through the nose, the false membrane being confined to the nasal passages and upper portions of the naso-pharynx. The face has an ashy-gray appearance, which may precede the fatal termination for many hours. The urine is scanty, often high-colored, and contains a variable amount of albumin.

What are the complications?

Extension of the membrane into the larynx or bronchi is common. Secondary pneumonia often develops, and general infection of the system through absorption of the poison also occurs. Sloughing of the tissues, caused by the false membrane, sometimes occurs, and also the infectious process may spread through the Eustachian tube to the middle ear, causing abscess of the part. Congestion of the kidney or desquamative nephritis is often a complication. Rarely endo- or pericarditis ensues.

What are the most frequent sequelæ?

Paralysis of the laryngeal, or, less frequently, of other muscles, is liable to come on in from one to two weeks after, sometimes cyanosis, and in rapidly-fatal cases the inflammation ceases. This is due to degeneration of the peripheral nerve-endings.

From what should it be diagnosed?

From follicular tonsillitis and croupous tonsillitis, also from the initial stage (sore throat) of scarlet fever, and from acute laryngitis and bronchitis in young children.

What is the prognosis?

The *prognosis* is unfavorable. It will greatly depend upon the condition of the throat and the extension of the membrane downward. The mortality is greatest in cold and damp seasons.

What is the treatment?

Attempts should be made to destroy the membrane by means of sprays, washes, or gargles, as the case may require. The drugs most frequently used are solutions of nitrate of silver (1 : 20), corrosive sublimate (1 : 2000), listerine (1 : 8), trypsin (1 : 4), and other antiseptics. The nasal cavity should be frequently swabbed out with an antiseptic solution. Where the membrane has been removed the ulcerating surface left should be dusted with a powder of iodoform, lactic acid, or some other disinfectant and healing application. Externally, cold in the form of ice-cloths or the ice-pack is generally applied to the neck. Internally, tinct. ferri chloridi and some of the preparations of strychnina are frequently used. Antipyretics are used as seem necessary. Continued stimulation by means of alcohol and the drugs which stimulate the heart should always be made in small quantities, to be increased as the case requires. If spasm of the larynx occurs from any (paralytic or mechanical) cause, tracheotomy or intubation is imperative. For the

paralysis following this disease nerve-stimulants, attention to the general health of the patient, and the use of electricity are indicated.

DYSENTERY.

What is dysentery? There are several forms.

A sporadic and epidemic disease affecting the colon, and characterized by frequent movements, generally containing blood and much mucus. The movements are accompanied by great griping and tenesmus.

What is the etiology? One of the four great epidemic diseases of the world. Both sporadic and tropic

It is produced by a pathogenetic poison. The infection is at first local. It is most common in tropical countries, where many constitutional diseases are followed by so-called secondary dysentery. It is not directly contagious. most in summer & autumn. more frequent in malaria, fevers. occurs at all ages and in all races. Dyspepsia conditions, fruit &c such as causing caused by bad food intro

What is the pathology?

It is generally a croupous inflammation of the colon, but the disease may be confined to the rectum and sigmoid flexure. In severe cases the disease extends as far as the lower part of the ileum. In milder cases the formation of a croupous membrane is rare.

What is the course of the disease?

The most pronounced symptoms are intestinal. At first the fever is slight. There is a feeling of discomfort in the abdomen, the bowels are irregular, followed by slight diarrhœa (two to six stools daily). In a few days the stools become very frequent (ten to sixteen), with a constant desire to evacuate the bowels, attended with tenesmus and burning feeling in the rectum and around the anus. The patient then has a pallid, drawn appearance; the stools become very scanty, sero-mucous, and with bits of mucous membrane, necrosed tissue, and coagula of blood in them; generally, bad odor of the dejecta is not marked. Sometimes there is considerable pain on micturition, and violent attacks of colic, vomiting, and hiccough. These symptoms last a week or ten days, when, if the patient should recover, the fever grows less, frequency of movements decreases, and a very slow convalescence begins. Frequently the disease becomes chronic, when all symptoms cease with the exception of the frequency of movements. In severe cases sudden collapse is liable to occur.

Mention the most frequent complications and sequelæ.

Abscess of the liver from absorption of septic material into the portal system is the most frequent. Peritonitis, general or local, with or without perforation caused by intestinal ulcer, also occurs. Inflammation of various joints or cutaneous abscesses are less frequent.

What are the prognosis and treatment?

Prognosis is generally good, but is much influenced by the age of the patient.

Treatment.—The patient should be isolated and his stools disinfected. When the patient is seen in the beginning of the disease a laxative, as ol. ricini, or an emetic, may be of good effect. In cases where the disease is established, enemas of starch containing laudanum and some astringents, and the use of suppositories containing some preparation of opium, are indicated. Ipecac in large doses is of benefit. Special attention should be paid to feeding the patient frequently and in small quantities by the most easily digested foods. For cardiac weakness camphor, ether, chloroform, and the rapidly-acting stimulants are used.

CHOLERA.

What is cholera?

An epidemic disease, characterized by vomiting, purging, accompanied with painful griping and spasms of the muscles of the abdomen and calves of the legs, and generally attended with coldness of surface and extreme collapse. It usually occurs in epidemics, but in certain parts of the world (India) it is endemic. It sometimes spreads from its endemic home in India in other directions, but mostly westward. Great epidemics appeared in Europe in 1817, again in 1830. In 1888 the disease spread and became epidemic in France, Italy, and the Spanish Peninsula. Slight epidemics have occurred in this country, the last one occurring in 1866.

What is its etiology?

It is caused by a specific micro-organism (Koch's comma bacillus). This is found in the intestines. It has the appearance of a short, thick, bent bacillus, which grows into long spiral threads, and it is tenacious of life, as it will live in a temperature as high as 100.4° F. The bacilli are found in the dejecta of cholera patients, and, owing to the lack of cleanliness, generally in all materials surrounding them or with which they have come in contact. The poison always follows the routes of human travel, and is not transmitted by the air, but it must be swallowed to cause disease. Gastric derangements, excessive heat, a lack of personal cleanliness, predispose to cholera. The disease is rarer in children than in adults.

What is its pathology?

The intestines are reddened. The mucous membrane is swollen. There is transudation of a large amount of mucus into the cavity of the bowel. Later on, the lining membrane presents a diphtheritic appearance, with patches of necrotic tissue. The muscles are contracted. The liver and spleen are pale. The blood is thickened and disorganized. The spleen is generally not enlarged. In the brain the membranes are congested and the puncta vasculosa are prominent.

What is the course of the disease?

The period of incubation is supposed to be usually about three days. The invasion is always sudden. The patient has sudden colicky attacks. Diarrhœa sets in, accompanied by rigidity and cramp-like contraction of the abdominal muscles and the muscles of the legs, which are rapidly followed by symptoms of collapse. In other cases the invasion is slower, lasting from a half hour to several hours, and beginning with slight diarrhœa, which becomes worse, and in the course of twenty-four hours the disease assumes its typical character. Occasionally these symptoms of slow invasion may last for a week, and the patient generally has nausea and slight vomiting. The temperature in the stage of invasion is elevated, and the pulse is full, quickened, and compressible. This stage is followed by that of evacuation. The movements become much more frequent, and consist of a whitish or brownish fluid; urinating of a watery, semi-solid fluid occurs; there are great thirst, marked contraction of the muscles of the abdomen and legs, subnormal temperature, a rapid and feeble heart, with a weak, thready pulse, often imperceptible in the radials, a cold clammy surface of the body, and a drawn, masked appearance of the face. Partial or total suppression of the urine generally accompanies this stage. This stage may last from ten to fifteen hours. The patient may die or go into the stage of collapse.

In the stage of collapse the vomiting and purging continue. The heart's action becomes very feeble. The skin has a dusky hue. The body has a shrunken appearance, and the temperature remains very low. Thirst becomes very excessive. The intellect generally remains clear throughout, unless the patient becomes delirious in the stage of invasion. This stage generally lasts not over twenty-four hours.

Should the patient still live, the stage of reaction sets in; evacuations become less frequent; vomiting ceases; pulse returns to the radials; cyanosis diminishes, and the temperature rises above normal. This stage is often interrupted by relapses, which are, as a rule, fatal. In some cases an eruption develops, the so-called choleraic erythema.

What are the complications?

Complications are generally fatal. The most common are erysipelas, pneumonia, acute nephritis, meningitis, pyæmia, or diphtheritic inflammation of the mucous membrane of the various organs.

What is the diagnosis?

Diagnosis is easily made, as a rule, in epidemics. At other times it must be diagnosed from cholera morbus, acute poisoning, and, in tropical countries, from cases of severe malarial disease. In cases where the dejecta can be bacteriologically examined the diagnosis can be confirmed.

What is the prognosis?

Prognosis is always uncertain, even if the symptoms are mild. The mortality, as a rule, varies from 50 to 75 per cent., according to the

severity of the epidemic. Those of middle age generally seem to stand the disease better than younger or older persons. Intemperance, the results of previous constitutional disease, or bad hygienic conditions affect the prognosis. The duration of the disease may be very short (two hours) or extend to several weeks, but in fatal cases death usually takes place on the second or third day.

What is the treatment?

Isolation and disinfection of the dejecta are of primary importance. Individuals living in an infected area should pay great attention to personal cleanliness and moderation in the use of food and stimulants. The patient should be bathed several times daily in a disinfectant solution. This procedure may also be used for the hands and clothing of the attendants. In the first stage enemata of opium and tannin, with stimulants, are most frequently given. The patient should be kept very quiet and wrapped in hot blankets. In the algid stage champagne, hypodermic injections of morphine, ether, or camphor are much used. As regards the food, thin porridge or mush only should be given. Small pieces of ice in the mouth are used to counteract the thirst. During the stage of collapse mild external stimulation and cardiac stimulants as necessary are indicated. During the stage of reaction careful nursing is most important, and arising symptoms must be treated as they occur.

Malarial Diseases.

What are malarial fevers?

A group of fevers the poison of which originates in the soil and is communicated to persons, but cannot be transmitted from one person to another.

What is the etiology?

The poison is probably localized in certain places, but is endemic at times in most parts of the world: a warm climate and permanent dampness of the soil seem to favor its development. The organism causing the disease is apparently a micrococcus, most frequently found in the serum of the blood or in the white corpuscles during the paroxysm. Liability to the disease is universal.

What are the varieties?

Intermittent fever, pernicious intermittent fever, remittent fever, chronic malarial cachexia, and the so-called masked intermittent.

Describe intermittent fever.

It is characterized by a short febrile movement; or there may be a prodromal stage of headache, general malaise, and pain in the muscles; or it may begin with a marked chill. These symptoms persist, and are quickly followed by shivering, generally nausea and vomiting, coldness of the skin, and rapid pulse. The internal temperature rises. In from

half an hour to two hours the shivering ceases, the skin becomes hot, the external temperature rises rapidly (103° to 105° F.); there is severe pain in the back and head; the pulse is rapid, and vomiting may continue. This lasts from two to twelve hours. The patient then breaks out into a profuse sweat. Temperature rapidly falls, the constitutional symptoms cease, and the patient generally falls asleep. These attacks may reoccur at intervals of twenty-four hours (quotidian), but it is more common to see the attack reoccurring once every forty-eight hours (tertian type). Exceptionally, the attacks only reoccur every third, fourth, or fifth day. The febrile movement, and also the duration of the various stages, differ much in different cases. In children these attacks are frequently not ushered in by a chill, but vomiting is generally marked.

What is pernicious intermittent fever?

A severe type of malarial fever, mostly seen in tropical countries, and generally preceded by several attacks of the ordinary form. The symptoms are similar, in the beginning, to those of simple intermittent, but vomiting is more marked and often assumes a hemorrhagic form. Jaundice is developed, and the patient generally becomes unconscious. This stage occurs from the third to the eighth day of the attack. The pulse becomes very rapid, weak, and thready; the temperature falls until it is slightly above the normal, or may become subnormal; and there are sometimes twitchings of the muscles of the face and arms. Frequently in these cases there is delirium, which is followed by stupor and coma, lasting from thirty-six to forty-eight hours. This type of the disease is very fatal.

What is remittent fever?

A form of malarial fever in which the temperature continues high (102°–104° F.), without total intermission, for a period of from four to seven days. There is generally a considerable decrease in the temperature either every morning or every evening. The symptoms are those of cases of intermittent, but the chill is not, as a rule, so marked, and the stage of fever persists for a longer time. Gastric, nervous, hemorrhagic, or other symptoms may predominate. The attack generally lasts from five days to a number of weeks.

What is malarial cachexia?

A constitutional condition sometimes found in those living in malarious districts. It is due to slight or severe, often-recurring, attacks of malarial fever. It is characterized by a peculiar sallowness of the complexion, general muscular weakness, anorexia, vertigo, sweating on slight exertion, pains in the joints or muscles, cardiac palpitation, and often marked diarrhœa or constipation. Occasionally nervous symptoms, as muscular twitchings or insomnia, are marked. There may also be a regular fever.

What is masked intermittent fever?

A form of malarial fever in which fever, as a symptom, is absent, but

other malarial symptoms recur from time to time. These are chiefly neuralgic, and affect the cutaneous terminations of the nerves. The attacks last a variable time, but are generally of short duration (half an hour to eight hours).

What is the diagnosis?

The *diagnosis* at first is often very difficult. A history of previous attacks or of the patient having lived, or living, in a malarious district, can often be of much assistance. Especial care should be taken to differentiate it from pyæmia, acute endocarditis, acute tuberculosis, the first stage of scarlet fever, yellow fever, and erysipelas. Malarial fever is often mistaken for the first stage of typhoid.

What is its pathology?

The liver is enlarged and congested. The spleen is swollen and soft, except in chronic cases, when it is often of very firm consistency and contains a large amount of dark fluid blood. There are no other pathognomonic symptoms, but general congestion of the internal organs is found. In the pernicious form of the disease the blood in the larger blood-vessels is often found disorganized.

What is the prognosis?

The *prognosis* depends mostly on the constitution of the patient, the number of previous attacks, and the type of the disease. The ordinary form of intermittent is very rarely fatal of itself, but many successive attacks predispose to other constitutional disorders. The pernicious form is generally fatal when it occurs in tropical climates among those not acclimated.

What are the complications and sequelæ?

Muscular rheumatism, various digestive disorders due to the chronic congestion of the liver and spleen, hemorrhoids, acute nephritis, endocarditis.

What is its treatment?

Quinine has always been considered almost a specific in the milder forms. Alcoholic stimulants, in combination with quinine, are extensively used to prevent attacks. The general custom is to first give an hepatic stimulant (calomel), and follow this, in from two to four hours, with a dose of quinine, to be repeated as seems proper. The hepatic stimulant is generally given about three hours before the chill is expected in cases of intermittent. Pilocarpine, given hypodermically (gr. $\frac{1}{10}$) or by the mouth, has been used to cut short the chill. As a prophylactic Warburg's tincture in ʒj or ʒij doses is highly esteemed. This remedy is also much given in the periods between the paroxysms. In the pernicious forms of the disease the paroxysm should be prevented by the immediate use of quinine (hypodermically). The paroxysm itself is best treated by the use of opium, chloroform, and also alcoholic stimu-

lants internally; heat to the body externally, and in the sweating stage the use of atropine and small doses of morphine are beneficial. Almost all cases of pernicious intermittent will require nourishing by the rectum. In all cases of malarial fever, especially where the attacks recur, the patient should remove from the malarial district. In malarial cachexia arsenic, strychnine, cod-liver oil, and the various tonics should be used. In the hemorrhagic form the general treatment, with the additional use of hæmostatics, is indicated.

Typho-malarial Fever.

What is typho-malarial fever?

A malarial fever in which typhoidal symptoms predominate.

Describe the symptoms.

There is a marked febrile movement of a remittent character, accompanied by severe abdominal pain, but especial tenderness, and gurgling in the right iliac fossa is absent. The tongue is often dry and furred in the centre. The pulse is small, rapid, and generally hard, and toward the beginning of the second week the patient becomes lethargic and has marked symptoms of the typhoidal state.

What are the prognosis and treatment?

The *prognosis* will depend greatly on the locality in which the case occurs. The mortality is much smaller than in typhoid. *General treatment* is the same as that of malarial fever, and other symptoms should be treated as they arise.

DENGUE.

Syn.—Breakbone fever.

What is dengue?

A disease occurring in the southern portion of this continent. It is especially characterized by sharp pains along the thighs and legs, and general soreness all over the body. It is also found in tropical and semi-tropical countries. Most authorities consider it to be both contagious and infectious. It is rarely fatal, and has no pathognomonic lesions.

Describe its course.

It begins suddenly with pain and stiffness in the muscles and joints. The pain is increased by motion, and there is a rapid but not very high rise of temperature. The pulse is frequent, and headache is sometimes marked. Pain increases for two or three days, and other symptoms become worse. Generally on the fifth day the pain diminishes or disappears, but it may recur. The temperature falls. At this time an eruption sometimes appears which takes the form of erythema, urticaria, or umbiliform spots. This is usually attended with itching of the

skin. Serious nervous symptoms, such as delirium, are rare. Swelling of the lymphatics often occurs.

What is the treatment?

No *treatment* to abort the disease or limit it is known. Treatment should be directed toward improving the general condition of the patient and to general symptoms as they arise.

YELLOW FEVER.

What is yellow fever?

An acute infectious disease of an epidemic nature, but endemic in small areas of country in tropical regions.

What is its etiology?

It is supposed to be caused by a specific micro-organism. It attacks strangers more frequently than those acclimated in the countries where it occurs. The mortality also is very much greater among foreigners than natives. Favorable conditions for its development are—high temperature, low barometer, dirty personal habits, and foul water. The specific poison is probably transmitted through the atmosphere, clothing, or fomites. Susceptibility to the disease seems to be universal, but the colored race appears to suffer less than the white. One attack generally secures immunity from subsequent ones.

What is the pathology?

There are no pathognomonic lesions, but the hepatic cells are generally found swollen and broken down, the tissue of the liver is yellow, and the blood is disorganized. There is jaundice of the skin, and often of other tissues. The changes of hemorrhagic nephritis are often found.

What are the symptoms?

The period of incubation lasts from one day to three weeks. Invasion is mostly sudden, but occasionally headache, sleeplessness, delirium, vertigo, nausea, and vomiting appear as prodromata. In cases of sudden invasion the patient is attacked with one or more chills or convulsions. There is a rapid rise of temperature (102°–105° F.). The face is flushed. There are marked headache, pain in the back, and often constipation and vomiting. The pulse may be full and moderately rapid (80–100) or abnormally slow. Occasionally there is delirium. The urine is scanty. These symptoms last from two to six days, when the fever declines and the stage of calm begins. Then the temperature and pulse are about normal, and the pains disappear. In some cases convalescence sometimes begins from this stage. Other cases go on to the third stage, in which there is marked vomiting of disorganized blood (black vomit). The patient is dull and apathetic, and the disorganized blood escapes into the tissues. The surface temperature is subnormal. The pulse is soft and compressible. Blood appears in the stools and urine, and may

exude from the mouth and nose. Stupor becomes more marked. The skin assumes a yellow hue (hemorrhagic jaundice). Cases which pass into the third stage generally end fatally. Where recovery takes place the convalescence is usually rapid. Occasionally cases are met with where the patient walks about until overcome with the severity of the disease.

What is the diagnosis?

At the commencement of the disease *diagnosis* is not always easy, but the presence of other cases of yellow fever in like locality will be of great help. It should be distinguished from the severer forms of malarial fever, remittent fever, and jaundice of hepatic origin.

What is the prognosis?

The *prognosis* depends greatly on the severity of the epidemic and the early appearance of the so-called black vomit.

What is the treatment?

The disease cannot be aborted, but quarantine of the patient and thorough disinfection are necessary. In the beginning of the disease absolute rest and hot mustard foot-baths may be used. Opium will relieve the pains somewhat. For the fever cold sponging or the free ingestion of small pieces of ice is of benefit. For the partial suppression of urine dry cups and diuretics are used. Alcoholic and other stimulants are given as necessary, and liquid food should be administered in small quantities at frequent intervals. For the cerebral symptoms the ordinary hypnotics are used. Black vomit should be combated by absolute rest for the stomach, mild counter-irritation to the epigastric region, and fixation of the abdominal muscles by a broad pad.

EPIDEMIC CEREBRO-SPINAL MENINGITIS.

What is cerebro-spinal meningitis?

An infectious disease, characterized by inflammation of the membranes of the brain and spinal cord, and often accompanied by an eruption on the skin.

What is its etiology?

The first epidemic accurately observed occurred at the beginning of this century. Sporadic cases occur occasionally. It is not known how the disease is transmitted, and it is not directly contagious. It is most commonly seen in childhood and young adult life, and is more frequent in winter and spring than at other seasons.

What is its pathology?

There is an exudative inflammation of the membranes of the brain and spinal cord, which closes up the cavities between the membranes,

and may even extend into the ventricles. Sometimes the inflammation extends to the substance of the brain, in which case it takes the form of a cerebral abscess. The micro-organism of the disease is a diplococcus.

What is its course?

The severity of cases differs very materially. The most malignant cases only occur during the course of an epidemic.

(1st) Should the case take on the malignant form, it begins with a sudden chill and rapid rise of temperature, quickly followed by unconsciousness, deep stupor, and death within a few hours. In ordinary cases prodromata are rare. The invasion, as a rule, is sudden; there are either slight or severe chills. Headache is intense, and mainly in the back of the head. There are stiffness and pain of the cervical muscles, and sometimes retraction of the head at this stage of the disease. But the fever varies greatly in intensity. The pulse is frequent, but afterward becomes abnormally slow. There are general muscular pains, but these are often succeeded by pain and some swelling in the joints. Delirium and great prostration from the commencement are sometimes present. The stage of invasion is followed by symptoms due to affection of the brain and spinal cord, such as headache, at first localized, then general and severe, and either continuous or intermittent; also pain in the nape of the neck, caused by the spinal meningitis, and tenderness along the spine. Sometimes opisthotonos, drowsiness, delirium, restlessness, or insomnia, followed by stupor alternating with delirium, occurs. In children convulsions often take place, and contractions of the voluntary muscles frequently occur in all cases.

(2d) Symptoms of a localized nervous character, such as strabismus, nystagmus, pupils at first contracted and afterward dilated, photophobia, contraction of the facial muscles and occasionally those of the jaw, then very acute hearing, followed by deafness, tinnitus aurium, cutaneous hyperæsthesia, and exaggerated cutaneous reflexes. All these symptoms result from implication of the roots of the various nerves or pressure upon them due to effusion. In cases where these symptoms are due to neuritis, they are often followed by hemiplegia, paraplegia, torticollis, aphasia, or blindness.

(3d) Symptoms resulting from the constitutional infection most frequently seen are such as herpes, erythema or purpura, slight jaundice, polyuria or glycosuria. Where the patient survives any length of time the pulse becomes abnormally slow. The fever is very irregular, and rapid emaciation and great prostration occur. The skin is dusky and the tongue dry. There are often a muttering delirium, retention of urine, and involuntary discharge of fæces.

The *duration* of the disease is generally from seven to twenty-one days, but convalescence in almost all cases is slow and tedious and interrupted by sequelæ.

What is the prognosis?

Where patients live to the second or third week of the attack the *prognosis* is usually favorable, but relapses may occur from exciting causes. Epidemics in which eruptions of the skin are common are generally attended with the greatest mortality.

From what should it be diagnosed?

From tubercular meningitis and from other acute eruptive diseases which may be ushered in with cerebral symptoms, also from croupous pneumonia complicated by meningitis. It may occasionally be confounded with spurious hydrocephalus.

What are the more common sequelæ?

Persistent deafness, affections of vision, chronic hydrocephalus, mental impairment, hemiplegia, paraplegia, aphasia, and acute endocarditis.

What is the treatment?

The patient is to be put abed, and none but liquid diet allowed. In young adults of full habits moderate bleeding in the first days of the disease is sometimes of benefit. Blisters on the nape of the neck or ice on the head or along the spine may be used. Internally, fluid extract of ergot and potassium iodide, with bromides, chloral, or some preparation of opium to quiet the cerebral symptoms. Special treatment for the fever is rarely necessary. For heart failure alcohol, strophanthus, digitalis, and caffeine are given. For the vomiting minim doses of carbolic acid, with or without drop doses of tincture of iodine, also sodium bicarbonate and oxalate of cerium. Special care should be taken to prevent the rectum or bladder from becoming overloaded.

HYDROPHOBIA.

What is hydrophobia?

A disease caused by inoculation with the virus of a rabid animal.

What is its etiology?

The poison is supposed to be contained in the saliva or blood of a rabid animal. In a large proportion of those bitten the parties escape infection, as they never exhibit the disease. The incubation period is generally from three to six months in duration, although it may vary greatly.

What is its pathology?

There is a congestion of the membranes of the brain and of the substance of the spinal cord, with an increase in the amount of the cerebro-spinal fluid. There is also a degeneration of the ganglionic cells of the chord.

What is its course?

It generally begins with malaise, headache and general uneasiness, painful sensations in the cicatrix if there is such, and a marked aversion to liquids. In one or two days the hydrophobic stage begins. Tonic spasms of the pharyngeal muscles, of the respiratory muscles, and of those of the trunk and extremities. The convulsions are reflex. They are especially excited by attempts at swallowing. The convulsions last from a few minutes to half an hour. There is great mental excitement, sometimes delirium or mania. Great thirst and marked salivation. The pulse is very full. Temperature is somewhat increased. This stage lasts from one to three days, when death occurs after violent convulsions or is preceded by a stage of paralysis and coma. Recovery hardly ever occurs.

What is the diagnosis?

The *diagnosis* is generally easy. The disease should be distinguished from traumatic tetanus and poisoning by the alkaloids, causing acute neurotic symptoms.

What is its treatment?

All wounds should be cauterized. Inoculation with attenuated virus (Pasteur) is much used. The *treatment* of the acute attack consists in mitigating the patient's sufferings by the use of narcotics and antispasmodics.

MUMPS.

Syn.—Parotitis.

What is parotitis?

An acute specific disease of an infectious nature, characterized chiefly by inflammation of one or both parotid glands.

What is its etiology?

It generally occurs in epidemics in children or young males. It is directly contagious. The incubation period is about two weeks.

What are its symptoms and its course?

There may be lassitude, slight headache, constipation, and a feeling of stiffness of the jaws for one or two days. Then one of the parotid glands begins to swell. The swelling rapidly increases, with œdema of the tissues surrounding it, although abscess rarely forms. The local discomfort is moderate and the fever generally slight. In men this disease is frequently complicated by swelling of the testicles, and in women by swelling of the breasts.

What is the treatment?

Patients are to be kept abed and protected from draughts. Pain from the tension of the skin over the gland, caused by the swelling, is much

relieved by greasing with vaseline or painting with iodine, with the application of an ice-bag. The diet should be liquid, and the bowels should be kept open by mild aperients.

TRICHINOSIS.

What is trichinosis?

A disease caused by the ingestion of meat infected with trichinæ, and characterized by symptoms due to the development of the parasite in the system.

What is its etiology?

The encapsuled parasite, on being brought into the intestinal tract and there subjected to the action of the digestive juices, is liberated. It proliferates, and migrates into the muscles, where it generally becomes encapsulated. When the muscle trichinæ reach the stomach they become intestinal trichinæ in from two to three days. The uteri of the females contain the ova, and the embryos are born seven days after ingestion.

What is its pathology?

The only characteristic change is found in the muscles. This consists in the presence of trichinæ. These are found most frequently in the diaphragm, the intercostal, laryngeal, and pharyngeal muscles, and also in the muscles of the calf and biceps. The fibrillæ of the muscles are often found in a granular condition, containing molecules of fat, and encapsulated therein the round worm, curled in a spiral form. The intestinal mucous membrane is sometimes hemorrhagic.

What is its course?

After the ingestion of infected material the patient has a feeling of pressure in the stomach, attended with nausea and vomiting. These symptoms occur in from two days to three weeks. There is generally diarrhœa, but occasionally obstinate constipation is met with. In the second week severe muscular pains come on; the muscles frequently are swollen and tender. The patient by preference lies motionless. Mastication, respiration, and deglutition are generally difficult. Occasionally there is general œdema, cutaneous eruptions, or free perspiration. Fever is generally absent or slight. In cases where the fever is marked the patient frequently rapidly passes into a typhoid condition, followed by death. Painful contractions of the muscles of the foot are often met with.

What is its treatment?

Narcotics and poultices for the relief of pain, and cathartics in the early stage of the disease, are indicated. Rectal alimentation may be

necessary, owing to difficulty of deglutition. Other treatment is symptomatic.

WHOOPING COUGH.

Syn.—Pertussis.

What is whooping cough?

A contagious disease, characterized by a peculiar violent, convulsive, and strangulated cough, occurring in paroxysms.

What is its etiology?

It generally occurs with epidemics of measles. The contagion is supposed to be carried by the air from the secretions of the mucous membrane of the throat and nose. It is rare in adults.

What are its symptoms?

The incubation period is uncertain: it begins with a catarrhal condition of the conjunctivæ and nasal mucous membranes, attended by cough. This cough is at first dry, but afterward becomes of a moist character. This stage lasts from two days to three weeks, and is followed by the spasmodic stage. The cough now occurs in paroxysms and begins abruptly: it consists of a number of short, quick, spasmodic, expiratory puffs, followed by a long, shrill inspiratory sound. During the paroxysmal attack the patient is often cyanotic, and slight hemorrhages from the naso-pharyngeal membrane may occur. Sometimes the paroxysms are followed by vomiting, or in young children by convulsions. The paroxysms vary in frequency, from fifteen to as many as thirty times in the twenty-four hours. This stage lasts from three weeks to three months. Between the paroxysms the patient often appears perfectly well; other general symptoms in this disease are rarely marked.

What are the complications and sequelæ?

The most frequent complications are pneumonia, emphysema, subacute bronchitis, tuberculosis, diarrhœa. Sequelæ are not marked, but extreme prostration and protracted emaciation are most frequent.

What is its treatment?

There is no specific *treatment*. Isolation is ~~of doubtful efficacy~~ good. In the treatment of the disease fresh air is of the utmost importance. Inhalations of carbolic acid, turpentine, or vapor of benzoin preparations are used. Internally, quinine, belladonna, and hypnotics are given. In cases where the paroxysms are especially severe chloroform or ether may be administered if extreme care is used. Insufflation of quinine or boric acid is often of benefit.

DISEASES OF THE RESPIRATORY ORGANS.

CORYZA.

Syn.—Cold in the head.

What is coryza?

A catarrhal condition of the mucous membrane of the nasal cavities, frontal sinuses, and of the naso-pharynx.

What is its etiology?

It is the result of exposure to cold or to chemical, vegetable, or mechanical irritants. According to some observers, certain forms of it are contagious. It also appears as a complication to many diseases.

What are its symptoms?

In mild cases the symptoms are local only. The secretion from the nasal mucous membrane is at first scanty; later on this becomes more abundant and watery. The nasal cavities are closed, and there is swelling of the mucous membrane. In children this condition is accompanied by dyspnœa. The sense of smell is diminished or abolished. The flow of mucus from the nasal cavities causes superficial dermatitis and excoriation of the upper lip, attended by some pain. In cases where the inflammation of these mucous membranes spreads to adjoining parts the symptoms are more severe. Headache becomes marked, and conjunctivitis, pharyngitis, or a mild form of laryngitis may develop. The temperature is generally but slightly influenced, but in severe cases may reach 103° F. at the beginning of the attack, when there is also chilliness, a general sense of weakness, and a soreness of all the muscles of the body. These symptoms last from two days to a week, and a steady convalescence commences. In elderly people or in those weakened by previous severe constitutional diseases there is danger of chronic bronchitis from extension of the inflammation.

What is the treatment?

If the secretion is abundant, inhalations of the vapor of terebene, carbolic acid, iodine, and ammonia together, or iodine alone, often give relief. Where the disease assumes a subacute form, the use of astringent sprays or astringent and sedative snuffs is indicated. Internally, the ammonium salts, small doses of tartar emetic, or tincture of aconite, frequently repeated, are of benefit. Complications, either laryngeal or pulmonary, are to be treated as they arise.

ACUTE PHARYNGITIS.

Syn.—Sore throat.

What is sore throat?

An inflammation of the pharynx, limited to the mucous membrane, and attended by redness and swelling. The affected parts are at first

dry, and afterward covered with a thick coating of glairy mucus. Occasionally, the surface of the tonsils is mottled with small white patches, due to the collection of coagula or mucus thereon.

What is its etiology?

Some persons seem to be much more liable to the disease than others. It is very common in young people, and recurrent attacks are frequent. The chief causes are exposure to cold, the inhalation of irritating gases, and unaccustomed and long-continued use of the voice. Sedentary habits and poor ventilation are predisposing factors.

What are its symptoms?

Difficulty in swallowing, a feeling of general malaise, and slight fever. At first a feeling of itching and dryness in the throat, followed by a tendency to expectoration, due to increased activity of the salivary glands.

What is its treatment?

Treatment consists in the use of astringent and antiseptic gargles and sprays of a like character. Insufflation of mild alkalies, bicarbonate of soda, etc. is beneficial.

ACUTE TONSILLITIS.

What is acute tonsillitis?

An acute inflammation of the tonsils, which may assume various forms of intensity.

What is its etiology?

It generally occurs in one of three forms—either catarrhal, follicular, or suppurative. The catarrhal and follicular forms are caused by exposure to cold or the inhalation of irritant material. The suppurative form is found most frequently in those of a rheumatic diathesis.

What is its pathology?

In the catarrhal form there are swelling of the mucous membrane and excessive secretion from the mucous glands. In the follicular variety the whole tonsil appears red and swollen, and dotted over its surface with numerous small white points, which cannot be brushed off. On pressure around these points a small plug of cheesy material exudes from the lacunæ. In the suppurative form the tonsil at first is universally enlarged and resistant to pressure; the surface is intensely congested; later on the substance of the tonsil is apparently fluctuating, and frequently a round white spot appears on its surface. In suppurative tonsillitis complicating infectious diseases the tonsil may become necrotic. All forms of the disease may affect both tonsils.

What are the symptoms?

The *symptoms* differ greatly according to the form of the attack. In

the catarrhal form fever is slight or absent, difficulty in deglutition is slight, and cough is not marked. In the follicular form there may be considerable difficulty in swallowing. Fever ranges from 100° to 102° F. There is general malaise, a feeling of soreness; also headache and constipation. Cases of this character generally last from three days to a week. In the suppurative parenchymatous form, the so-called quinsy sore throat, the attack is generally ushered in by a chill, a marked rise of temperature, 101°–104° F., and much difficulty in swallowing. The other constitutional symptoms are also marked. On examining the throat the affected tonsil or tonsils are seen as a large, hard, red swelling. Where the disease is unilateral, this is often great enough to encroach upon the base of the uvula and force it to the opposite side. There are generally pain and stiffness of the muscles of the jaws, and the patient is forced to breathe through the mouth, owing to the partial closure of the naso-pharynx by the swelling. Headache is not often marked, but anorexia and constipation are always leading symptoms. The pulse is quick, full, and tense. All these symptoms increase in severity up to, from the seventh to the tenth day of the disease, when the inflammation results in resolution or abscess. Recurrent attacks, every year, of this parenchymatous form are very common.

What is the prognosis?

In all forms of the disease the *prognosis* is favorable, except in cases complicating severe constitutional affections.

What is the treatment?

The *treatment* of the catarrhal form is the same as that for acute pharyngitis. In the follicular variety the same general plan of treatment may be used, but also touching the inflamed lacunæ with a solution of nitrate of silver (10 gr. to ℥j) or the solid stick of lunar caustic, or with compound tincture of benzoin, is of great use. In the suppurative form an hepatic stimulant, followed by a saline aperient, should be given at first. The strength of the patient is to be kept up by moderate stimulants and concentrated food. Locally, hot poultices about the neck, with astringent and antiseptic gargles, may be used in the first stages of suppuration. As soon as pus appears the tonsil should be opened. High temperature may be combated by antipyretics.

ACUTE CATARRHAL LARYNGITIS.

What is acute catarrhal laryngitis?

An acute inflammation of the mucous membrane of the larynx.

What is its etiology?

It is generally caused by taking cold or by direct mechanical or gaseous irritants, and it often complicates other diseases.

What are the symptoms?

The symptoms differ greatly with the variety of the disease. In mild cases there are a slight febrile movement, partial loss of voice, and an occasional hoarse, barking cough. In these cases pain in the larynx and dyspnœa are generally slight. In the more severe cases, and generally in those which occur in children, there are chilly sensations, slight anorexia, partial or total loss of voice, considerable dyspnœa and pain in the larynx, and a barking, stridulous cough, paroxysmal in character. In all cases the mucous membrane of the larynx is more or less red and swollen, at first dry, and afterward covered with white tenacious mucus. The attacks usually last from a few days to two weeks, and are liable to recur.

What is the differential diagnosis?

The disease is liable to be confounded in children with croup, and also with scarlet fever (with marked throat symptoms) and diphtheria. It should be distinguished from croup by the difference in temperature, the attacks sometimes occurring in the daytime, the absence of cyanosis, and dyspnœa being slight; from scarlet fever it may be distinguished by the redness and swelling of the mucous membrane of the fauces and tonsils, also by the high temperature and severe constitutional symptoms at the beginning of the attack; from diphtheria it is often impossible to make the diagnosis in the earlier stages of the disease, but a history of chill, extreme prostration, difficulty in swallowing, and high temperature ought to lead one to suspect diphtheria.

What is its treatment?

All injurious causes should be removed; the patient should be kept in a room of even temperature, and have plenty of warm demulcent drinks. The inhalation of hot steam, or of steam combined with the vapor of antiseptic or astringent drugs, gives much relief. Poultices or hot compresses to the neck may be used. In children at the beginning of the attack an emetic may prove of benefit. Narcotics where the paroxysms are severe may be used with caution; also in such cases, when attended with cyanosis, ether in stimulant doses (by inhalation) is often followed by good results.

CROUP.

What is croup?

A disease of childhood, characterized by an acute inflammation of the larynx and trachea, generally accompanied by the formation of a fibrinous exudation on the affected parts.

What is its pathology?

The mucous membrane of the larynx, trachea, and occasionally the upper bronchi, is swollen and hyperæmic, and contains a great number of leucocytes. It is covered by a membrane consisting of coagulated

fibrin, which can, as a rule, be readily stripped off from the underlying mucous membrane.

What are its symptoms?

The disease often begins insidiously. There is slight difficulty of respiration, which becomes more marked at night. There may be slight cough and hoarseness of the voice, with moderate fever. In two or three days the symptoms of obstruction, due to exudation in the air-passages, develop, and at night there are intense paroxysms of coughing, attended with dyspnœa and cyanosis. The fever then increases somewhat, the cough becomes stridulous, and often a whistling sound is heard with inspiration. In a variable time (two to seven days) the cough becomes looser, and portions of the detached false membrane are often expectorated. In cases which have a fatal termination the end is preceded by increasing cyanosis; the voice is generally lost or sinks to a whisper; all the auxiliary muscles of respiration are called into play; and the patient succumbs to the want of oxygen. In many cases there is a temporary improvement in the symptoms, often followed by a more severe and frequently fatal attack.

From what should it be differentiated?

From acute catarrhal and croupous laryngitis or tracheitis, from the initial stage of scarlet fever when attended by severe throat symptoms, from diphtheria, and from acute follicular tonsillitis; also from the croupy, barking cough of young children with intestinal irritation. Whooping cough may be mistaken for this disease in its initial stage. Close observation of the patient for twelve to twenty-four hours will prevent any false diagnosis.

What is its treatment?

Patients subject to this disease should be warmly, but not too heavily, clothed. Indoors they should not be subjected to sudden changes of temperature. The internal treatment of the attack is often begun by giving an emetic of hot water, syrup of ipecac, or mustard and water, followed afterward by doses of the bromides, repeated at frequent intervals. For the local congestion and spasm of the larynx the application to the throat of hot cloths or sponges wrung out in hot water and mustard seems to give the greatest relief. If the attack should last a number of days, the patient must be fed on liquid diet, and generally alcoholic stimulants are found necessary. Should cyanosis develop, the inhalation of oxygen gives relief, but this improvement is generally but temporary. In cases of marked laryngeal obstruction intubation or tracheotomy may become necessary.

ACUTE BRONCHITIS.

What is acute bronchitis?

A catarrhal inflammation of the bronchial tubes.

What is its etiology?

It appears most common in early or advanced age, and the more frequent predisposing causes are pernicious habits, chronic pulmonary or cardiac disease, a debilitated condition of the system, living in a damp climate, and certain occupations. The predisposition to the disease varies greatly. The most common exciting causes are catching cold, the extension of the inflammation from the mucous membrane of the larynx, or direct irritation from mechanical or chemical agents. It is frequently a symptom or complication of infectious diseases.

What is its pathology?

The changes are found in the trachea and in the large and medium-sized bronchi. The mucous membrane is red and swollen, at first dry and afterward covered with a glairy mucus. Owing to the swelling of the mucous membrane the lumen of the bronchi is narrowed. Extension to the bronchioles is rare.

What are the symptoms?

The *symptoms* vary with the age of the patient. In mild cases in adults there are cough with scanty expectoration, a feeling of tightness over the front of the chest, and general malaise. This class of cases generally lasts one week. In severe cases, in adults, the cough is more marked, and is attended with copious mucous expectoration, sometimes streaked with blood. The attack is attended with slight dyspnœa, and the general symptoms are quite marked. These cases last about two weeks, but sometimes become chronic where the disease occurs in old people. There is much prostration, accompanied by some rise in temperature, which is very apt to be irregular. Both inspiration and expiration are much impeded. The cough is very troublesome, being at first dry, and afterward attended by the expectoration of large quantities of white glairy mucus. Delirium is sometimes present, and there is progressive loss of appetite and strength, attended by emaciation. The pulse is quick, small, and feeble. Should there not be improvement in two weeks, the disease often ends fatally. In young children, owing to the bronchi taking up a large part of the lungs, an inflammation of the mucous membrane of these tubes gives rise to great dyspnœa. These cases, as a rule, are preceded by inflammation of the mucous membrane of the upper air-passages. In severe cases there may be convulsions, high fever, and rapid pulse. The attacks generally last two weeks, but infants, especially those with unhygenic surroundings, often succumb early to the attack.

What are its physical signs?

The *physical signs* differ greatly, according to the age of the patient and the time the examination is made. As a rule, vocal fremitus is unchanged in children. There may be slight dulness on percussion, and in old people this sign is often marked over the bases of the lungs pos-

teriorly (hypostatic congestion). The voice is unchanged, and also the breathing, though in severe cases expiration is somewhat prolonged. With both inspiration and expiration large and small moist sibilant and sonorous râles are heard. The number and intensity of these râles will depend greatly on whether the examination is made just before or after a paroxysm of coughing.

From what should it be diagnosed?

From whooping cough, pneumonia, acute tuberculosis, and the various forms of laryngitis. Pleurisy is occasionally mistaken for this disease.

What is the prognosis?

Prognosis will depend greatly on the age of the patient. In those in the prime of life it is rarely fatal, except as a complication of infectious diseases, heart disease, or where the hygienic surroundings are bad. It is often fatal in infants or the aged, and a guarded prognosis should always be given in these cases.

What is its treatment?

At the commencement of the attack free action of the skin should be encouraged by hot drinks, saline diaphoretics, or Dover's powder in small doses. Should the patient be robust and the attack begin in a severe form, moderate bleeding may be used. Tightness across the chest is often much relieved and expectoration increased by the application of flaxseed-meal poultices to the chest. Internally, the expectorants, combined with sedatives or antispasmodics if the cough is annoying, may be used. Also for dyspnœa or the dry cough medicated vapors give great relief. Where the disease occurs as a complication of infectious diseases or heart affections, and also when occurring in old people, the free use of stimulants is necessary. Antipyretics are rarely needed.

CHRONIC BRONCHITIS.

What is chronic bronchitis?

A catarrhal inflammation of the bronchial tubes of a chronic character.

What is its etiology?

It frequently follows repeated attacks of the acute form. It also often complicates the gouty or rheumatic diathesis, and is very frequent in old people. Heart disease and other chronic disturbances of the circulation dispose toward it.

What is its pathology?

There is a continuous excessive secretion from the mucous glands of the bronchi. As a result of this the glands and surrounding tissue become hypertrophied, and the walls of the bronchi thicken and their calibre is decreased.

What are its symptoms?

In mild cases there is only occasional cough and expectoration of frothy mucus, unattended by constitutional disturbance, with the exception of slight fever. There may be a constant feeling of weight over the chest, but dyspnœa is not marked. In the severer cases the cough is often paroxysmal, and is worse in the morning and evening. The expectoration is profuse and muco-purulent in character. Fever of a mild type is usually present, but is irregular. There is slight constant or spasmodic dyspnœa.

What are its physical signs?

The vocal fremitus and voice show no marked changes. The percussion note is normal, but sometimes there is a comparative dulness at the bases of the lungs posteriorly. All over the chest are heard whistling rhonchi with coarse and moist râles. Vesicular murmur shows no marked changes, but expiration is prolonged.

What is its prognosis?

Owing to the course of the disease being generally very long, a guarded *prognosis* should always be given. The disease itself is rarely fatal, but elderly people often succumb to intercurrent affections.

What is its diagnosis?

It may be mistaken for tuberculosis, emphysema, or the bronchorrhœa due to chronic cardiac disease or chronic disease of the liver and kidneys.

What is its treatment?

As the disease occurs most frequently in winter, the patient should go to a suitable climate if possible. During the attack the patient should be kept in a room of an even temperature, and if expectoration is scanty the air should be kept moist by means of aqueous vapor. Poultices at night over the chest will often relieve the tightness and sense of weight. Internally, the various salts of ammonia, the alkalies, and iodide of potash are extensively used. Inhalations of steam medicated by the addition of oil of turpentine, terebene, tincture of iodine, or the tincture of benzoin may be employed. The pneumatic cabinet has been extensively used.

ASTHMA.

What is asthma?

A spasmodic contraction of the bronchi.

What is its etiology?

Theories as to its origin differ greatly. Some say it is due to a sudden swelling of the mucous membrane of the bronchi, and others to a tonic spasm of the muscles of the smaller bronchi. There may be an heredi-

tary predisposition to it. Diseases of the pharynx or nose and the inhalation of certain odors can produce it. It is frequently a complication of bronchitis of old people, advanced heart disease, or of nephritis in various stages.

What are its symptoms?

In its typical neurotic form it attacks the patient suddenly, and chiefly at night. The patient awakes with a feeling of oppression and discomfort, and has to gasp for air. Both inspiration and expiration are difficult, and the auxiliary muscles of respiration are called into play. The pulse is markedly quickened, and is either full and bounding or small and thready. Fever is absent or very slight. In severe cases there is sometimes slight cyanosis, but a pinched expression of the face and blueness of the lips are frequent. The attack may last from a few hours to several days.

What are its physical signs?

The vocal fremitus is somewhat increased, also the vocal resonance. On percussion there is a deep wooden sound, inspiration and expiration are both prolonged, and the vesicular murmur is accompanied by sibilant and sonorous râles.

What is its diagnosis?

It may be mistaken for spasm of the glottis, pseudo-angina pectoris, or very rarely for spasmodic croup in adolescence.

What is its prognosis?

The *prognosis*, as regards the attack itself, is favorable. Attacks are very liable to recur, and complete immunity from them is rare.

What is the treatment?

Patients should, if possible, live in a locality where experience teaches them they are free of attack. For the attack iodide of potash in large doses, nitro-glycerin, quinine, the bromides, or belladonna may be used. For the relief of the spasm inhalation of the iodide of ethyl or the smoke from burning stramonium, hyoscyamus, pyridine, or saltpetre are of benefit; and internally, the narcotics, lobelia, quebracho, grindelia, or hyoscyamus, in small and frequently repeated doses.

PULMONARY EMPHYSEMA.

What is pulmonary emphysema?

An abnormal dilatation of the air-vesicles of the lungs, often attended with intra-collapse of the walls of neighboring vesicles.

What is its etiology?

The most common predisposing *cause* is loss of elasticity of the walls of the pulmonary vesicles, attended by increased extra- or intravesicular pressure. The exciting causes are pressure on the walls of the vesicles,

due to chronic disease of the heart or other diseases, causing obstruction of the pulmonary circulation, or else sudden excessive dilatation of the alveoli, with rupture of their walls. This is due, in most cases, to forcible inspiration, such as occurs in asthma, and as the result of various occupations in which the respiratory organs are brought into excessive and prolonged action.

What is its pathology?

In old people this condition is often found as a natural result of the general decay and atrophy of the organs. The lungs, instead of having a bright-red color, present grayish spots in places. On pressure of the lung-substance a crackling sensation is felt, and on section small cavities are seen.

What are its symptoms?

The disease is a very chronic one in its development, and is secondary to other diseases. The *symptoms* attending it are those of the complicating affection. From the lack of oxygenating surface due to the destruction of the air-cells, there is dyspnœa, especially marked on exertion, and cyanosis. The affection is often attended by a hacking cough and an expectoration of mucus streaked with blood, and hemorrhages small in quantity. The urine is generally scanty in quantity, and contains a large amount of urates. Patients with this affection generally suffer from chronic constipation.

What are its physical signs?

On inspection the upper portion of the chest is seen to be very broad (barrel-shaped), vocal fremitus is decreased, and the percussion note is high-pitched (hyper-resonant), and at the base of the lungs has a wooden character. On auscultation the vesicular murmur is feeble, and expiration is generally attended by whistling rhonchi of a dry character. Inspiration is short and expiration prolonged. The heart-sounds are often faint and distant, but the second sound is frequently accentuated.

From what should it be diagnosed?

From asthma in its various forms, and the dyspnœa caused by chronic cardiac, nephritic, or hepatic disease.

What is the treatment?

Owing to the nature of the disease it cannot be cured. *Treatment* should be directed to allaying the symptoms.

PLEURISY.

What is pleurisy?

An inflammation of the mucous membrane covering the surface of the lungs and lining the internal wall of the chest.

What is its etiology?

The most frequent *cause* is exposure to wet and cold. It also occurs as a complication in pneumonia, where the inflammation spreads to the surface of the lung. In cases where tubercular deposits or neoplasms are situated on the surface of the lungs, local pleurisies often result. Traumatism and extension of inflammation from neighboring parts are a frequent cause of the disease. In cases of general blood-poisoning this membrane, in common with other serous membranes, is very liable to inflammation.

What is its pathology?

It takes one of three forms: there may be effusion of serum alone, of serum and fibrin with resulting adhesions, and of serum, fibrin, and pus in the cavity bounded by the pleura. The pleura is of a dull-red color and covered here and there with patches of white fibrinous exudation. Threads of fibrin extend from the costal to the pulmonary pleura, and in the pleural cavity a quantity of fluid may be found, varying according to the type of the disease. This fluid may be serous, seropurulent, or hemorrhagic in quality. In some cases the effusion of serum is very slight, and becomes rapidly organized, these constituting the so-called cases of dry pleurisy.

What are the lesions of dry pleurisy?

The inflammation begins in the costal pleura and extends to the pulmonary pleura opposite. As a rule, only a circumscribed area of the pleura is involved. This area is coated with a thick layer of fibrin.

What are the causes of dry pleurisy?

It is caused by direct irritation of the pleura from injury, cold, extension of inflammation from neighboring parts, blood-poisoning, and from various other causes, and often occurs as a complication of severe constitutional affections.

What are its symptoms?

There are slight cough, accelerated breathing, and a stabbing pain in the side, especially marked on deep inspiration. This is generally felt in one axillary line or under the angle of the scapula. This pain is often so severe as to apparently cut short the breath. The temperature ranges from 99°–101° F. The pulse is somewhat accelerated at the beginning of the attack. Headache (frontal) is generally present, but is not severe, and malaise is not marked.

What are its physical signs?

Pulmonary signs are normal, except over the affected area. Over this space vesicular murmur is often feeble, and with both inspiration and expiration a friction murmur is heard. At the first this murmur is soft in quality, but as the disease progresses it becomes harsh and loud, and is heard with inspiration and expiration. As the attack subsides the

friction murmur resembles the moist râles of capillary bronchitis, but is heard on both inspiration and expiration, and is not changed in quality by forced breathing or coughing.

What is the duration of dry pleurisy?

In almost all cases the exact *duration* of the attack cannot be fixed, as many cases are unattended by pain or general symptoms. Where the disease is well marked the attack generally lasts from seven to twelve days.

What is the treatment?

Most cases require no *treatment* except keeping the patient in an even temperature. In the more severe cases poultices or counter-irritants may be applied to the affected part. Narcotics in small doses may be necessary to relieve the cough or pain in the side. Fixation of the chest by means of plaster straps is of value.

What are the lesions of pleurisy with effusion?

In pleurisy with effusion the inflammation is more extensive than in the dry form, and sometimes the pleuræ of both sides are involved. The pleural membrane is covered with a thick coating of fibrin, but there is also a large effusion of serum. In many cases this effusion of serum causes more or less compression of the lung. Adhesions between the costal and pulmonary pleura are much more extensive and frequent after pleurisy with effusion than after dry pleurisy.

What are its causes?

The *causes* are the same as those producing the dry form.

What are its symptoms?

The *symptoms* are similar to those of dry pleurisy, but generally more severe and acute. The disease begins with chilly sensations or a marked rigor, and a temperature of 100°–102° F., with general muscular pains and prostration. The marked pain at the end of inspiration is often absent, but the cough is more frequent and is dry in character. As the disease progresses more or less dyspnœa develops, and should the lesion be on the left side there may be cardiac palpitation and irregularity, due to the displacement of the heart.

What are the physical signs?

When the disease commences the physical signs are similar to those of dry pleurisy. As the effusion takes place, at the level of the fluid and below, there is absence of voice and vesicular murmur, and vocal fremitus and flatness on percussion occur above the level of the fluid. The percussion note is generally tympanitic, and the vesicular murmur has an exaggerated broncho-vesicular note. In subacute or chronic cases of pleurisy with effusion the affected side often appears the more prominent. On recovery flatness on percussion often persists over the affected lung.

What is the duration of the disease?

The disease always lasts a number of weeks, and is often protracted for a long time. Where it occurs as a complication of other diseases it sometimes ends fatally. Most cases recover with a damaged pleura, which forms a favorable nidus for the development of phthisis.

What is its treatment?

In the acute stage, externally, poultices and counter-irritants may be used with narcotics for the relief of pain. Where the disease is unilateral, strapping the chest with adhesive plaster gives great relief. The bowels should be kept open and the heart stimulated where necessary. After the acute symptoms have subsided the use of saline cathartics and diuretics is indicated to reduce the effusion. During convalescence especial attention should be directed to building up the general condition of the patient, remembering the possibility of heart failure on exertion. After recovery some form of athletic exercise, to increase the expansive power of the lungs, and thus reduce the probability of phthisis, is indicated.

What are the lesions of empyema?

Only one side of the pleural cavity is, as a rule, affected. The pleura is coated with fibrin containing many pus-cells, and its cavity contains a variable quantity of purulent serum. Generally the amount of effusion is sufficient to compress the lung of the affected side.

What are its causes?

The *causes* are similar to those leading to the other forms of pleurisy, but this form occurs more frequently in patients who are phthisical or have been living in unhygienic surroundings.

What are its symptoms?

If it follows pleurisy with effusion or the dry form, the *symptoms* are those of that form; but where it begins as a purulent effusion, the attack is ushered in by a marked chill. The temperature rapidly rises often to 104° F., and there is a feeling of weight in the affected side. Dyspnœa is quite marked and prostration is extreme. The beginning of the attack is also generally attended by sweating. These symptoms persist for a week; then loss of appetite becomes marked, and there is progressive loss of flesh and strength. After the first few days pain (pleuritic) is either absent or very slight, the patient has attacks of sweating at irregular intervals, and the temperature is very variable (pyæmic). In cases where the disease progresses without operative interference the general symptoms become more marked and the patient dies of exhaustion, generally attended by coma and apnœa, which is often preceded by a typhoid condition.

What are its physical signs?

The physical signs are those of pleurisy with effusion, but the dulness

on percussion and loss of vesicular murmur is often more marked, and the inspiratory movement of the chest is less noticeable.

What is its prognosis?

The *prognosis* is always uncertain. It is most favorable in children and young adults who are operated upon early in the course of the disease. In very young children, in adults over thirty years of age, and in all cases where the disease occurs as a complication of other diseases the prognosis is unfavorable.

From what should it be diagnosed?

From pneumonia, acute phthisis, abscess of the liver, and acute pleurisy, particularly on the right side, with effusion.

What is the treatment?

Aspiration should be tried first, but if the purulent fluid reaccumulates, a free incision with resection of a rib should be made and drainage established. This incision is made preferably in the posterior axillary line at the level of the sixth rib.

TUBERCULAR PLEURISY.

What is tubercular pleurisy?

A localized tubercular inflammation of the pleura which usually affects a portion or the whole of the pleura of one side. This is often secondary to tuberculosis of the adjacent parts.

What are the pathological changes?

The pleural membrane appears bright-red in color and mottled with small white spots of tubercular tissue, and the pleural cavity contains more or less bloodstained purulent fluid.

What are its symptoms?

The initial *symptoms* resemble those of pleurisy with effusion, but fever is more marked. The fever often has an intermittent character, and the attacks are followed by sweating. The patient, instead of improving, slowly becomes worse, and finally succumbs to the disease.

What are the physical signs?

The physical signs are those of pleurisy with effusion, to which are often added the graver signs of empyema.

What is the treatment?

Treatment locally should be directed to the alleviation of pain. The general treatment is that of tuberculosis.

PNEUMOTHORAX.

What is pneumothorax?

A collection of air in the pleural cavity.

What is its etiology?

Usually caused by penetrating wounds of the chest, by the perforation of a tubercular pulmonary cavity into the pleura, or by a perforating abscess of any of the surrounding organs.

What is its pathology?

The lung is retracted and compressed against the upper and inner part of the pleural cavity. If this condition has lasted many hours, the surface of the pleural membrane is covered by a layer of glairy lymph, and a small amount of effusion may be found at the base of the pleural cavity. Should the patient live a longer time, the surface of the pleura may be covered by fibrin, and the pleural cavity is more or less filled with serous or sero-purulent fluid.

What are the symptoms?

The onset is very sudden; generally there are *symptoms* of profound collapse. The patient is either pale or cyanotic, breathing is short and quick, and severe pain is felt in the side. On forced inspiration the movement of the affected side is hardly noticeable. Should the pneumothorax be caused by empyema or abscess of the lung perforating into the pleural cavity, there will be marked expectoration of pus. A hacking cough, attended by the expectoration of frothy mucus, is generally present.

What are its physical signs?

The percussion note is loud and deep, extending beyond the limits of normal lung percussion. Should the perforation be on the right side, the normal area of liver dulness is decreased, respiratory murmur is absent, and amphoric breathing is generally present. Vocal fremitus is diminished or absent. Usually we get splashing sounds (succussion) if the patient is shaken with the ear applied to the chest.

What is the result of pneumothorax?

In many cases death ensues in a few hours, especially where the perforation of the pleural cavity is external. Where the perforation is that of the pulmonary pleura, recovery sometimes occurs, but the patient generally succumbs to the underlying disease.

What is its treatment?

For severe pain morphia should be used, and if the pneumothorax is followed by large effusion, aspiration may be necessary. Beyond this *treatment* is governed by the causes of the pneumothorax.

HYDRO- AND HÆMATOTHORAX.

What is meant by hydro- and hæmatothorax?

An effusion of serum or sero-sanguineous fluid into the pleural cavity.

What is their etiology?

They may be caused by obstruction of the venous circulation, by malignant disease of the pleura, or by traumatic laceration of the pleural or pulmonary blood-vessels.

What are the symptoms?

The *symptoms* are those of pleurisy with effusion, and their severity will depend on the amount of fluid in the pleural cavity.

What is the treatment?

The entire *treatment* should be directed to removing the primary cause. Where the effusion is caused by cardiac disease, or in cases where it is caused by chronic nephritis or cirrhosis of the liver or by congestion of the venous circulation, such remedies as indicated for these causes should be used. In cases of tuberculosis or carcinoma of the pleura temporary relief may be afforded by aspiration, although this is only a palliative measure. In all cases medicines which increase the excretion from the kidneys, skin, and bowels are of benefit.

NEW GROWTHS OF THE PLEURA.

What new growths are met with in the pleura?

Almost all neoplasms met with in the pleura are secondary. They are generally nodules due to either carcinoma, sarcoma, or tuberculosis.

What are the diagnosis, prognosis, and treatment?

Diagnosis is difficult unless the primary lesion is well marked. *Prognosis* is unfavorable. *Treatment* should be symptomatic.

NEW GROWTHS IN THE MEDIASTINUM.

What tumors are met with in the mediastinum?

In the anterior mediastinum sarcomata are sometimes met with, mostly in youth or early adult life—more rarely carcinomata or lymphomata.

What are the symptoms?

They are those due to compression of the neighboring structures, such as dyspnœa, pain, paralysis, disturbances of deglutition, and hydrothorax due to compression of the pulmonary veins. On physical examination dulness of the anterior portion of the chest is sometimes found. Care should be taken not to confound these tumors with aneurisms of the aorta.

What are their prognosis and treatment?

Prognosis is unfavorable, and *treatment* is symptomatic.

FŒTID BRONCHITIS.

What is fœtid bronchitis?

A form of bronchitis in which the secretion of the mucous membrane has a marked fœtid odor, due to putrid decomposition of the excreted mucus.

What is its etiology?

It may be an accompaniment of chronic bronchitis (especially of old persons), of bronchiectasis, of gangrene of the lung, or of pulmonary tuberculosis.

What are its symptoms?

They are those of the disease which causes the fœtid mucous excretion.

What is its diagnosis?

Care should be taken to diagnose it from ozæna or croupous stomatitis. In cases which are caused by gangrene of the lung microscopic examination of the sputum will show pulmonary tissue. In cases of bronchiectasis or pulmonary tuberculosis physical examination will show the cause.

What is its treatment?

It is that of the originating cause.

BRONCHIECTASIS.

What is bronchiectasis?

A dilatation of one of the larger bronchial tubes.

What is its etiology?

There is an inflammation of the mucous membrane of the bronchial tube, followed by its erosion or necrosis, and extension of this process to the underlying tissues of the wall of the tube. The paroxysms of coughing cause a dilatation of the weakened and thinned wall of the tube.

In what conditions is this disease most frequently found?

Phthisis, chronic purulent bronchitis, emphysema, and extensive adhesion of the lung to the chest-wall, due to dry pleurisy.

What are the varieties of bronchiectasis?

(1st) Cylindrical, where a bronchial tube is uniformly dilated: this may be secondary to bronchitis, emphysema, whooping cough, or other diseases attended by long-continued and forcible attacks of coughing.

In these cases the dilatation of the bronchial tube is long continued and gradual; the excreted mucus is thin and quite abundant.

(2d) Saccular, where a portion of a bronchial tube is dilated, almost entirely on one side: this dilatation generally occurs gradually, although it may occur suddenly from an ulceration of the bronchial membrane. It is usually caused by the ulcerations of phthisis.

What are the physical signs?

In the cylindrical variety numerous small moist râles are heard on auscultation over the area of the affected tube. In the sacculated variety the physical signs resemble those of a tubercular cavity. Where the bronchiectasis is deep-seated in the lungs the physical signs are very indefinite.

What are the symptoms?

The *symptoms* are principally those of the primary disease, but there is a large amount of expectoration of thin glairy mucus, and in the sacculated form the sputum may be muco-purulent. The sputum is very abundant, and is expectorated in paroxysms of coughing.

What are the prognosis and treatment?

Both *prognosis* and *treatment* are dependent on the primary cause of the lesion.

STENOSIS OF THE TRACHEA.

What is meant by stenosis of the trachea?

A contraction of the calibre of the trachea.

What is its cause?

It may be caused by disease in the vicinity of the trachea, such as enlargement of the thyroid gland, arterial aneurism, tumors of the mediastinum, swelling of the lymphatics or other growth in this neighborhood, or by disease of the trachea itself, such as polypi, carcinomata, syphilitic cicatrices, or inflammation resulting from foreign bodies or acute irritants.

What are its symptoms?

If the stenosis is slight, there is only a feeling of discomfort and slight dyspnœa; if more marked, dyspnœa is very distressing, expiration is prolonged, breathing is stridulous, and the pulse is generally increased in frequency. Cough is generally present and aggravated by slight external causes.

What are its prognosis and treatment?

Prognosis and *treatment* depend upon the exciting cause.

STENOSIS OF THE BRONCHI.

What is meant by stenosis of the bronchi?

A narrowing of the calibre of a bronchus.

What is its etiology?

It occurs more often in the right than in the left bronchus, and is generally caused by the presence of a foreign body; it may be caused by aneurism of the aorta, enlarged heart, or the pressure of tumors.

What are its symptoms?

There are generally dyspnœa and a whistling sound all over the affected side. On inspiration this side does not dilate as much as the other.

What are its prognosis and treatment?

Prognosis and *treatment* depend on the primary cause. Where the trouble is caused by a foreign body, removal may be attempted. When not relieved, the lesion is often followed by emphysema or lobular pneumonia.

PULMONARY ŒDEMA.

What is pulmonary œdema?

A congestion of the lungs caused by the exudation of the albuminous fluid constituents of the blood into the alveoli and lung tissue, and generally attended by an abnormal excretion of bronchial mucus.

What is its etiology?

It is a complication of other diseases causing congestion of the lung, and is often caused by the gradual onset of heart failure preceding death.

What are its symptoms?

Marked dyspnœa, accelerated respiration, and cyanosis of the face, with large, coarse râles all over the chest, are the most marked *symptoms*. There may be frothy expectoration. Percussion note, as a rule, is normal.

What is the treatment?

Remedies are almost invariably powerless, as œdema is usually a sign of approaching death. In the few cases where it is caused by temporary heart failure the volatile stimulants, with counter-irritation or cupping of the chest, may be of benefit.

PNEUMONIA.

What is pneumonia?

An inflammation of the pulmonary tissue.

What are the two principal forms of pneumonia?

Bronchial pneumonia, also called catarrhal or lobular pneumonia, and croupous pneumonia, also called lobar pneumonia.

What is the etiology of catarrhal pneumonia?

It generally occurs as an extension of a bronchitis. The secretion accumulates in the bronchioles and alveoli; fungi collect, and set up decomposition in the sputum. This process gives rise to pneumonia. Inhalation into the bronchi of particles of food often acts as an exciting cause of this form of pneumonia. It also often follows infectious diseases, and is most frequent in children and old people.

What is the pathology of catarrhal pneumonia?

The walls of the bronchi are inflamed, thickened, and infiltrated with cells, as is also the surrounding tissue; the pulmonary alveoli are in the same condition, and their cavities are filled with fibrin, pus, and epithelium. The inflammation is found in circumscribed scattered areas, and the pulmonary blood-vessels are engorged.

What are its symptoms?

In young infants there are fever, prostration, frequently coma and rapid breathing. Owing to the age of the patient, physical signs are generally indefinite, but the disease is fatal as a rule. In older children and adults the beginning of the pneumonia is often obscured by symptoms of the primary disease; in children there are sometimes convulsions. The respirations are frequent (forty to sixty a minute); there are considerable restlessness and frequent, painful cough. The face is pale, the pulse rapid, and the temperature ranges from 104° to 105° F. There is often a feeling of heaviness in the chest, but rarely any pain, unless the inflammation extends to the pleura and sets up a pleurisy.

What are the physical signs?

The signs in general are those of a diffused bronchitis. On auscultation small and medium moist râles are heard: there are sometimes bronchial breathing and bronchophony. The percussion note is sometimes dull or tympanitic over the affected areas.

What is the prognosis?

The *prognosis* in children is always bad. Severe cases succumb in from two to fourteen days. Most cases are protracted, and may die from exhaustion or development of tuberculosis.

What is the treatment?

Prophylaxis is only limited to the prevention of bronchitis in infectious diseases and the prevention of the extension of it when it occurs. When signs of catarrhal pneumonia develop, poultices or dry cups to the chest may be used. In children emetics at the commencement of the disease are sometimes of benefit. Narcotics may be used where pain

is marked, but great care must be used in their employment; where convulsions occur antispasmodics (particularly bromides) are indicated; stimulants may be used in moderation, and the dose will depend on the condition of the vascular system. In convalescence the various tonics are of benefit, associated with change of climate. The muriate of ammonium is always of benefit, especially in small, frequently repeated doses where the disease occurs in children. Where the stronger alcoholics are not borne by the stomach, champagne is indicated, especially in older people; the most easily assimilated food only should be administered.

CROUPOUS PNEUMONIA.

Syn.—Lobar pneumonia; Lung fever; Pleuro-pneumonia.

What is croupous pneumonia?

It is a primary acute inflammation of the lung tissue.

What is its etiology?

It is supposed to be caused by a specific pathogenic germ called the diplococcus pneumoniæ. A certain constitutional state of the body seems to predispose to it; also excess in the use of alcohol; and some chronic diseases may act as a predisposing cause. It sometimes follows exposure to cold or traumatism. It is most frequent between the ages of eighteen and forty.

What is its pathology?

In fatal cases the affected portion of the lung is dark-red on section, and small gray points of fibrin project from the bronchioles. It does not crepitate on pressure, and a portion of the affected lung sinks when immersed in water. On microscopic examination the alveoli and smaller bronchi are filled with a hemorrhagic coagulable exudation which contains large numbers of white blood-cells and pneumococci, and the mucous membrane of the neighboring larger bronchi is congested. Should a fatal result occur early in the disease, the red color will be most marked on section of the affected portion of the lung. Should the patient live until the fourth day or later, the section of the affected lung will show more or less of the gray points of so-called hepatization. The disease generally affects one or more lobes—is more frequent on the right than on the left side. Where resolution occurs the products of inflammation exuded into the alveoli soften down and are absorbed by the lymphatics, and to a certain extent by the blood-vessels.

What is the course of the disease?

The disease generally begins suddenly with a marked chill, followed by a feeling of fever and weight in the affected side; occasionally these symptoms are preceded for a few days by a feeling of malaise, loss of appetite, and headache. After the chill the temperature rises progressively, and there is often severe pain on inspiration. If the pneu-

monia is situated at the surface of the lung and gives rise to pleurisy, the breathing is shallow and accelerated; the pulse ranges from 90–130, and the temperature generally rises to 103° F. or more. Painful cough is generally present, attended by tough, bloody, muco-purulent expectoration, which soon becomes rusty in color. These symptoms last from twenty-four to sixty hours. Then the temperature remains high; there are anorexia, often delirium, and vomiting. Constipation is marked. The respirations are from 30 to 60, and the pulse from 100 to 160, small and quick; the tongue is dry, with a typhoidal coating. The urine is diminished from the commencement of the disease, and from the second day onward frequently contains a large amount of uric acid and more or less albumin. The chlorides are diminished. These symptoms, as a rule, last from the third to the ninth day, when, if recovery takes place, they rapidly diminish; the fall of temperature is sudden as a rule; occasionally it is gradual.

The crisis generally occurs on from the fifth to the eighth day, when the temperature often falls to subnormal. Recovery from the disease is generally rapid, but may be protracted, owing to complications. All the symptoms of pneumonia may be masked where it occurs as an intercurrent affection or is complicated by other diseases. Where the disease originates at the root of the lung or where it occurs in the aged or in alcoholics, many of the marked acute symptoms are often wanting.

What are the physical signs?

On inspection no change in the chest is seen except in cases complicated with large pleural effusion, when the affected side may be the more prominent. The respiration is accelerated, and the affected side moves less than the other. On percussion the note is at first somewhat dull, and later on tympanitic or wooden in character. On auscultation, at first large and small or crepitant râles are heard over the affected area; as consolidation progresses the breathing loses its exaggerated vesicular character and becomes loud, sharp, and bronchial. Should the case go on to resolution, large moist râles are heard on auscultation, and the breathing regains its vesicular character. Voice over the affected area is high-pitched and bronchial, and bronchophony is generally present. Vocal fremitus is increased.

What are the most frequent complications?

In almost all cases pleurisy occurs as a complication. Other frequent complications are endo- and pericarditis, congestion of the liver, nephritis, cerebral congestion, or a meningitis.

What is the diagnosis?

The disease is most frequently mistaken for pleurisy with effusion; also it may be mistaken for acute bronchitis attended with little expectoration, but this only in the earlier stages.

What is the prognosis?

Prognosis should always be guarded. The disease when it occurs in old people or in those of alcoholic habits is generally fatal; in other cases, if the patient lives until the sixth day, prognosis should be favorable unless complications should ensue.

What is the treatment?

Many authorities believe the disease may be aborted at its commencement by large doses of calomel or quinine. After acute symptoms of pneumonia develop the *treatment* is mainly symptomatic. Should there be pain from complicating pleurisy, hot poultices, mustard plasters, or dry cups applied to the side will give relief. Where cough and pain are both severe, morphine, hypodermically, would be of most benefit. In all cases of pneumonia narcotics should be used with great caution, especially where there is any symptom of cardiac weakness. In plethoric individuals bleeding to a moderate extent, six to ten ounces, is sometimes found useful in the commencement of the disease. For high temperature quinine, in 10 to 15 gr. doses, or phenacetin, 5 grains every three hours, are most used. Stimulants are always indicated, and the amount to be given will depend upon the condition of the heart and whether the patient has a previous alcoholic history. Digitalis or other cardiac stimulant should be used when the heart is weak and in cases where heart failure is threatened. Aromatic spirits of ammonia and ether in small doses internally are of great benefit. The diet should consist of concentrated liquid food. Where delirium is a marked symptom, opium in large doses may be used, provided the action of the heart is carefully watched.

PULMONARY TUBERCULOSIS.

Syn.—Phthisis; Consumption.

What are the varieties?

This classification is made according to the occurrence of the physical signs and rapidity of progress of the disease: acute miliary tuberculosis and chronic miliary tuberculosis.

What is its etiology?

The disease is caused by a bacillus, which fact was first demonstrated by Koch in 1881. These bacilli are small, rod-like bodies, with a length of one-fourth to one-half the diameter of a red blood-corpuscle. The bacillus may be introduced into the body through the inhalation of dry sputum of a person affected with tuberculosis, or by the use of utensils which have been used by a tuberculous person. A weakened condition of the body predisposes toward tuberculosis, and the disease is often met with in members of the same family. It is most frequent between the ages of fifteen and thirty years.

What is the pathology?

The changes due to tuberculosis may occur in any organ of the body, but are most frequent in the lungs. It is characterized by the formation of small nodules in the peribronchial tissue. In these nodules are found colonies of bacilli and large so-called giant-cells, which may contain the bacilli. The nodules themselves consist of a caseous material, which, not being furnished with blood-vessels, is of poor vitality, subject to death and subsequent softening. Should many nodules, situated close together in the neighborhood of a bronchus, soften, they will cause obliteration of the bronchiole, collapse of the alveoli, and the formation of a tubercular cavity. In some cases these cavities heal, and are replaced by cicatricial tissue. In a few cases the tubercular nodules are infiltrated with lime salts, and further progress of the disease is arrested by their calcification. In acute, rapidly-progressing cases the tubercular infection frequently spreads to the intestines or membranes of the brain, and the disease is quickly fatal, owing to involvment of these organs.

What are the symptoms and causes of the disease?

Symptoms will differ according to the seat of the disease. In cases where the disease is rapid and many tubercles soften at once, pulmonary cavities are formed, giving their physical signs. In other cases, where the tubercles are scattered through the lungs and do not coalesce, all symptoms and physical signs may not be marked. As a rule, the disease begins slowly, and is attended with slight cough, expectoration, pain in the chest, and shortness of breath. After a few weeks there are marked loss of appetite and consequent emaciation, pallor of the skin, and a general feeling of weakness. The temperature begins to be above normal at night, and there is chilliness, followed by sensations of fever and night-sweats. At this time cough becomes a more marked symptom. The temperature is often considerably elevated without giving subjective symptoms of heat to the patient. All these symptoms continue for a greater or less period of time, together with progressive emaciation. In quite a number of cases there is a standstill for some years. In all cases pain in the side is due to the violent contractions of the muscles in coughing or to a dry pleurisy caused by many tubercles being situated on the surface of the lungs. Cough is always a marked symptom, but the amount of expectoration attending it differs greatly in the various cases. Where softening and the formation of cavities occur, expectoration is very profuse and muco-purulent in character. Where the cough is very severe the sputum is frequently streaked with blood, but where a cavity is formed ulceration into a blood-vessel may cause more or less coughing up of bright-red blood, (hæmoptysis). As a rule, hæmoptysis occurs without any previous warning, although it is sometimes preceded by a feeling of oppression. Dyspnœa is rarely marked unless the patient has had a number of attacks of dry pleurisy (then due to pleuritic adhesions). In all cases of phthisis the action of the heart is tumultuous. The second sound of the heart is generally

markedly accentuated, and frequency of respiration is usually above the normal.

What are the physical signs?

The pulmonary signs of the disease are most frequently found at the apices of the lungs. Over the infected areas the percussion note is dull and expiration prolonged, vocal fremitus is increased, and more or less fine and coarse râles are heard, particularly at the end of inspiration. Should softening with the formation of cavities take place, the voice and breathing are bronchial or the amphoric percussion note is tympanitic, and loud bubbling or coarse râles are heard over the situation of the cavity. In cases where recovery takes place the affected side is generally somewhat retracted, the percussion note is dull, and the vesicular murmur is feebler than on the normal side of the chest. Breathing often still has a bronchial character. In almost all cases the pleura is more or less involved, and we have the physical signs of pleurisy added to those of phthisis. Occasionally the pleurisy involves the pericardium, causing more or less displacement of the heart. In cases of disseminated miliary tuberculosis all marked physical signs may be wanting. Marked dulness on percussion above the clavicle is often a symptom of commencing phthisis: in some cases auscultation in the axilla will show râles if none are heard in other parts.

What are the most frequent complications?

Pleurisy, pneumothorax, tuberculosis of the larynx, pharynx, stomach or intestines, or nephritis.

What are the diagnosis and prognosis?

The *diagnosis* is always easy where the tubercular bacilli are found in the sputum. In cases where there is marked softening or where cavities have been formed the diagnosis is also easy. The disease in its early stages may be confounded with typhoid fever, malarial fever, diabetes, simple anæmia, or chronic bronchitis, with acute exacerbation or malignant neoplasm of the lungs.

In the majority of cases the *prognosis* is unfavorable, but the duration of the disease cannot be foretold. In a few cases recovery takes place.

What is the treatment?

The patient should be isolated and have plenty of fresh air and the most nourishing food. All excretions should be disinfected. Internally, creasote and cod-liver oil, with the iodides, have proved to be of most benefit. For symptomatic treatment inhalations of iodoform or astringent and narcotic vapors often relieve the cough. Sponging and the use of phenacetin and extract of hyoscyamus internally are of benefit for high temperature and night-sweats. In cases where pleuritic pain is marked counter-irritation of the chest and narcotic treatment are indicated. When hæmoptysis occurs the patient should be given absolute rest in a supine position, with an ice-bag to the chest, and gallic acid and other

astringents and narcotics internally. For the loss of appetite tonics are always indicated. In all cases where practicable the patient is to be removed to a dry climate at a moderate altitude.

INTERSTITIAL PNEUMONIA.

Syn.—Fibroid phthisis.

What is interstitial pneumonia?

A disease characterized by a slow increase of the interstitial tissue of the lungs.

What are its causes?

Any prolonged irritation of the lung tissue causes a chronic congestion of the lungs, attended with proliferation of the connective-tissue cells. The most frequent exciting *causes* are the inhalation of irritating vapors or small particles of foreign bodies, and the case may be accordingly named stone-cutter's phthisis, miner's phthisis, etc.

What is the pathology?

The peribronchial interstitial tissue is much increased, as are also the number and size of the interstitial cells between the vesicles. As a consequence of this the calibre of both bronchioles and vesicles is diminished. On section there is more resistance on cutting the lung tissue, and the tissue has a paler appearance, than normal. It may be gray or black, according to what the irritant material has consisted of. This discoloration is generally found in nodules.

What are the symptoms?

The *symptoms* are those of chronic bronchitis, sometimes complicated with symptoms of emphysema. The symptoms and course of the disease are progressive unless the patient is removed from the exciting cause.

What are the prognosis and treatment?

Treatment in all cases is symptomatic. *Prognosis* as to complete recovery is bad. As to partial recovery, the prognosis would depend on whether the patient can be placed in proper hygenic surroundings or not. This disease often furnishes a suitable nidus for the development of tuberculosis.

GANGRENE OF THE LUNG.

What is gangrene of the lung?

The decomposition and death of a certain portion of lung tissue.

What are its causes?

It is caused by the entrance of the bacteria of putrefaction into the lung: these bacteria may be carried there by the inhalation of foreign substances or particles of food, and also by the inhalation of mucus or

muco-pus in cases of ulceration of the mouth, pharynx, or larynx. Occasionally it is caused by ulceration extending from the pleura or neighboring organs into the lungs. Rarely an embolus infected with bacilli causes gangrene of the lung. The disease occurs most frequently at the lower lobes, especially at the right side.

What is its pathology?

The affected portion of the lung is discolored and often gray in color. If the disease has existed for any length of time, it is changed into a soft, pultaceous, foul-smelling mass, and bronchial ectasic cavities are found in the neighborhood of the necrosis.

What are the symptoms?

The *symptoms* are those of fœtid bronchitis. Expectoration is generally profuse, and a microscopic examination of it shows portions of the parenchymatous tissue of the lungs. Fever is marked and pyaemic in character. The physical signs are often obscure. It is often complicated by pleurisy or pneumothorax, and intestinal irritation is often a prominent symptom from swallowing the infected sputum. Dyspnœa is rarely marked. The pulse is often accelerated.

What is the diagnosis?

Diagnosis should be made from fœtid bronchitis, bronchiectasis, and perforation of the lung, from empyema or malignant disease starting in the neighborhood of the lung, mediastinal or visceral.

What is the prognosis?

The *prognosis* will depend on the underlying disease and the strength of the patient. It is always very grave, but some cases recover.

What is the treatment?

The *treatment* is mainly symptomatic. Antiseptic inhalations, the best of food, and hygienic surroundings are very necessary.

EMBOLISM OF THE LUNGS.

What is meant by embolism of the lungs?

A plugging of the pulmonary artery or one of its branches.

What is its etiology?

Secondary, generally speaking, to an inflammation of the valves of the heart or the valves of the large arteries, this inflammation is productive of an accumulation of fibrin in the diseased parts. The force of the blood-current detaches particles of fibrin and carries them into the pulmonary circulation, where they are unable to pass a vessel of smaller diameter than their own. As a result of this an area of pulmonary tissue is deprived of its blood-supply. It is most frequently found as a result of endocarditis, pyæmia, endarteritis, and diseases attended with

an increase of fibrin in the blood, accompanied by feeble circulation, and of puerperal fever.

What is the pathology?

The area of the lung from which the blood has been cut off is generally wedge-shaped, with its small end toward the root of the lung. It is dark-purple or brown in color, according to the length of time it has existed, except in cases where the embolus or infarct has contained septic matter. In these latter cases the embolic area may be gray in color, and show signs of abscess, or even the greenish softening of gangrene if the patient has lived long enough for this change to take place. In size the embolic area or infarctions vary greatly. On section the affected area of pulmonary tissue is firmer than in other portions, does not crepitate, and sinks in water. Microscopic examination shows the blood-vessels to be filled with disintegrated blood-cells, fibrin, and leucocytes, which latter are also found in the lung tissue in the immediate neighborhood of the embolic area.

What are the symptoms?

The *symptoms* depend greatly on the size and situation of the embolus. Where a very large blood-vessel is occluded, death may be instantaneous or preceded for a few moments by intense and sudden dyspnœa; in cases where the embolus is smaller, especially where complicating cardiac valvular disease exists, there may be a slight feeling of depression in the chest and a sudden cough with bloody expectoration. Where the embolus is very small acute symptoms are rarely present. If the embolus is large, there are dulness on percussion, crepitant râles, and bronchial respiration over the affected spot. Should it be situated near the surface of the lung and not immediately fatal, the physical signs of acute pleurisy will be found. Fever is rarely present, but may exist if the trouble is caused by a septic embolus followed by abscess or gangrene.

What are the prognosis and treatment?

The *prognosis* depends greatly on the causative disease and on the severity of the symptoms immediately following the embolism. *Treatment* is symptomatic, but in all cases perfect rest (supine position) should be insisted upon.

BROWN INDURATION OF THE LUNG.

What are the etiology and pathology?

Prolonged engorgement of the pulmonary vessels, such as occurs in heart disease, causes the lungs to assume a brown color and become hard and dense, as is seen on section. The capillaries are dilated and all portions of the connective tissue are increased in quantity and become thickened. The walls of the blood-vessels are generally thickened, but degenerated. The alveoli become diminished in size.

What are the symptoms?

As a consequence of the diminution of the size of the alveoli, the dyspnœa in case of heart disease is augmented, cough is present, and often large pigmented cells are expectorated. On physical examination high-pitched inspiration with prolonged expiration is heard. The symptoms of chronic bronchitis are often added to the others.

What is the treatment?

Treatment should be directed to relieve the pulmonary congestion and the alleviation or cure of the primary disease.

TUMORS OF THE LUNG.

Cancer occurs in the lung, but is generally secondary. Secondary sarcoma occurs but rarely. Echinococcus cysts and syphilitic gummata also occur. *Treatment* is symptomatic. In rare cases surgical interference may be admissible.

DISEASES OF THE CIRCULATORY SYSTEM.

Diseases of the Heart.

ACUTE ENDOCARDITIS.

What is meant by acute endocarditis?

An acute inflammation of the lining membrane of the heart.

What are the etiology and pathology?

Any particle of irritating material circulating in the blood-current may settle upon the walls of the heart or the surface of the valves and produce an inflammation. This condition is most frequently found in cases of rheumatism, tuberculosis, septicæmia, pyæmia, the acute infectious diseases, and the puerperal state. The inflammation of the endocardium may be very rapid, and cause ulceration if the irritating material is septic in character, or the inflammation of the endocardium may take on a longer and milder course if the irritating material is non-septic. The endocardium appears thickened and often nodular. When the process occurs on the valves, it is generally found near their free edges; in the acute form these thickenings break down and give rise to ulcerous patches. Where the valvular form occurs in adults, it is most common in the aortic and mitral valves. Valvular endocarditis is the most frequent cause of embolism.

What are the symptoms?

Mild cases of acute endocarditis often give rise to no *symptoms*, except slight oppression in the chest and dyspnœa on exertion. As the disease generally occurs as a complication, the symptoms are often masked by those of the predominant disease. When occurring in the course of rheumatism, pyæmia, or other acute exanthemata, it generally begins

with palpitation, dyspnœa, and pain in the cardiac region. The pulse is accelerated, full, and strong. Fever, if present, may show a slight increase; the face is flushed and wears an anxious expression. In cases of ulcerative endocarditis the face may be pale and drawn and the pulse rapid, small, and wiry. Respiration is accelerated, and frequently there are anorexia and acute gastric disturbance: other existing symptoms are generally due to an accompanying disease.

What are the physical signs?

The superficial area of cardiac dulness is often apparently increased; the apex-beat is generally much intensified, except occasionally in cases of septic endocarditis. At the situation of the apex-beat or over the aortic valves a loud blowing, systolic murmur is present. In rare cases this murmur appears to be diastolic in point of time. In the aortic valvular type the murmur is often propagated into the subclavian area.

What is the prognosis?

The acute ulcerative form is always fatal. The acute non-septic endocarditis generally assumes a chronic form, and *prognosis* depends upon the severity of the symptoms of the causative disease. High fever, cerebral symptoms, or hemorrhage is always of grave import.

What is the diagnosis?

Physical examination of the heart is the greatest factor in the *diagnosis*, and great care should be taken not to confound the malignant form with cases of acute meningitis, acute miliary tuberculosis, or typhoid fever. The non-septic form must be differentiated from simple cardiac palpitation, asthma, or acute gastro-enteric disturbance. In all cases the diagnosis will be much facilitated by considering the primary disease.

What is the treatment?

In the septic form little can be done for the disease itself. In the non-septic form complete rest in the supine position must be insisted upon, and cold applications should be made to the region of the heart. For irregular cardiac action digitalis may be used. For dyspnœa counter-irritants to the chest and morphine or hyoscyamus internally are best. For sudden cardiac failure the diffusible stimulants, such as ether, camphor, or ammonia, should be given either internally or by inhalation. The diet should consist of concentrated liquid food in small quantities, given at frequent intervals.

CHRONIC ENDOCARDITIS.

What is chronic endocarditis?

A chronic inflammation of the lining membrane of the heart, usually situated upon the valves.

What is its etiology?

It may follow on the acute form, but often runs a chronic course from

the start. The most frequent exciting causes of it are recurrent attacks of rheumatism, arthritis deformans, or repeated irritation of the endocardium from chemical or mechanical influences, alcoholism, nicotine-poisoning, syphilis, or immoderate muscular exercise. Chronic nephritis is sometimes followed by endocarditis. It may occur at any age, but is most commonly noticed between the ages of eighteen and forty.

What is the pathology?

In the mural form the endocardium is thickened, whitish in color, and projects slightly in hypertrophied areas. In the valvular form the endocardium is at first thickened, and this thickening is often followed by calcification or ulceration and subsequent contraction of the valves. Where the process occurs on the free edges of contiguous valves an ulceration takes place. It may be followed by adhesion of the affected part. As a result of these processes insufficiency or stenosis of the valves takes place. In cases where the body has not attained its full physical development the insufficiency of the valves is compensated for by an increase in the size of the heart-cavities, also in the amount and power of the heart-muscle. Where the disease occurs in those of adult life, the cavities of the heart dilate, but there is not sufficient increase in the cardiac muscle to compensate for the dilatation. As a result of this there is engorgement of the venous system.

What are the physical signs?

The most common form of valvular endocarditis is insufficiency of the mitral valve. In these cases at each systole of the heart there is some regurgitation of blood into the auricle, and this, meeting another current of blood, produces a loud, blowing murmur. This is heard most distinctly at the situation of the rebound—that is, the situation of the apex-beat. This murmur may be transmitted around the side of the chest or over the situation of other cardiac openings. In these cases there is generally enlargment of the area of cardiac dulness, most marked on the left side. In long-continued cases of mitral disease the area of dulness of the right side is much increased. The second sound is often accentuated, but the pulse is large, firm, and generally regular. The apex-beat is diffused over a large space.

Mitral stenosis is often associated with, and generally follows, mitral insufficiency. Owing to the stiffness and thickening of the leaves of the valve, and often to adhesion between two contiguous leaves, the blood is forced through with difficulty, and is accompanied by a murmur. This murmur is diastolic or presystolic in character, not very loud, and generally transmitted to the base. The second sound is very sharp or reduplicated. The murmur is most distinct over the situation of the mitral valve, and also the situation of the apex. The pulse is very small and irregular. The area of cardiac dulness is generally universally enlarged, and, on the left side of the chest over the cardiac space, this area is sometimes permanent.

Insufficiency of the semilunar valves may arise from inflammation of the heart or the blood-vessels. As a result of it the blood regurgitates during diastole into the left ventricle, and causes a murmur, which is heard loudest at the upper portion of the sternum. This murmur often has a musical pitch, and is sometimes transmitted to the apex. The left ventricle is much dilated and the apex-beat displaced. The enlargement of the ventricle often causes a bulging visible on inspection, and the area of cardiac dulness is found to be increased by percussion. Visible arterial pulsation in the larger, and sometimes in the smaller, arteries is often marked, and the murmur is often transmitted along them. The radial pulse is of a jerky character.

Stenosis of the aortic valves is not very common. Hypertrophy of the left side of the heart is marked, and the cardiac pulsations are slow and weak. The murmur heard in this form of disease is low, and most distinctly heard in the second intercostal space at the time of systole, and is transmitted to the right.

Insufficiency of the tricuspid valve occurs, as a rule, with other valvular affections. The area of cardiac dulness is increased, particularly over the situation of the right ventricle. Along the course of the jugulars a venous pulse is visible, and often pulsation may be felt in the hepatic veins. A systolic murmur is heard at the sternal extremity of the fifth rib on the right side or over the lower portion of the sternum.

Stenosis of the tricuspid valve rarely occurs, except congenitally. The murmur accompanying it is diastolic or presystolic, and is heard most distinctly over the situation at the third costo-sternal junction of the left side.

Insufficiency of the pulmonary valves is accompanied by the physical signs of hypertrophy of the right side of the heart and a diastolic murmur in the region of the pulmonary valves. This form of valvular endocarditis is not often met with.

Pulmonary stenosis is generally a congenital disorder. General venous engorgement, attended with cyanosis, is a marked symptom. On physical examination, inspection and percussion show hypertrophy of the right side of the heart, and a systolic murmur is heard over the heart. This murmur is most marked in the second left intercostal space. Most patients afflicted with this disease generally die before their fifth year.

The physical signs of all these valvular affections may appear in combination, but, as a rule, the symptoms of one affection will predominate over the others.

What are the subjective symptoms, complications, or sequelæ?

Dyspnœa, increased on exertion, and caused partially from congestion in the pulmonary circulation and partially from obstruction in the circulation of the heart, occurs early in the disease. Palpitation after mental or physical strain, and occasional pain of a piercing character in the cardiac region, generally exist. Also there are generally vague pains in the shoulders and all over the body, headache, and slight disturbances

of digestion. The action of the heart becomes irregular, and there is often sudden acceleration of the heart-beats without apparent cause. In cases where the action of the heart is habitually weak a venous stasis is a prominent symptom, and the skin assumes a cyanotic appearance. This is often accompanied or followed by œdema of the eyelids or ankles, and in advanced cases by general dropsy. Rarely embolism or thrombosis in the smaller arteries, with the resulting symptoms, takes place. Occasionally mental derangement arises from this cause. In all cases where the disease is advanced chronic congestion of the liver, spleen, and kidneys occurs, with the resulting appearance of albumin and bile-pigment in the urine, and digestive disturbances due to interference with the portal circulation.

What are the prognosis and treatment?

A definite *prognosis* can never be given. In cases where the compensating hypertrophy is efficient the disease may last for a long time and give little inconvenience. Any occupation involving physical exertion increases the danger. Cases of aortic insufficiency appear to run the longest course. Many cases of mitral disease also run a very slow course.

The disease cannot be prevented, but may be often mitigated by great care during attacks of acute rheumatism and by preventing the recurrence of such attacks. Where the disease is developed exertion of all kinds should be prohibited. If the compensation is not efficient, digitalis may be used, but the pulse should be watched very carefully, especially on account of the cumulative action of the drug. Caffeine and its preparations, convallaria, sparteine, and strophanthus also act well for the œdema. Rest, massage, and diuretics are of benefit. In case of marked ascites paracentesis may be necessary. For the dyspnœa morphine, acetate of lead, the preparations of ammonium, counter-irritants, and mild purges are most frequently used. For the palpitation the application of cold to the præcordium and the internal administration of the bromides or narcotics give most relief.

MYOCARDITIS.

What is myocarditis?

An inflammation of the cardiac muscle, followed by increase of the interstitial elements and degeneration of the muscular elements of the heart. This degeneration is due to the contraction of the new connective-tissue formation.

What are its etiology and pathology?

The predisposing *causes* are chronic alcoholism, syphilis, mental overexertion, and cardiac strain due to dilatation of the aorta. As a rule, the valves are not implicated in the process, but the coronary arteries show atheromatous changes. As a result of the diminished supply of

blood the muscular elements of the heart are degenerated. On section the heart-muscle is found of a grayish color; the walls are firm, but thinner than normal; the cut surface of the heart presents a marked resistance to the finger. On microscopical examination the interstitial cells are found much increased in number and size, and the muscular elements are smaller than normal, and often contain minute oil-globules or small opaque spots.

What are the symptoms?

The *symptoms* are similar to those of valvular endocarditis, with the exception of absence of the murmur. Arhythmia is more frequently found in myocarditis than in endocarditis. The disease generally begins with palpitation and dyspnœa, which gradually increase; sooner or later symptoms of systemic, circulatory, or digestive disturbance take place. The area of cardiac dulness is generally enlarged, and occasionally a soft blowing, systolic murmur is heard over the base of the heart. In the course of the disease the patient is liable to attacks of extreme dyspnœa or sudden sharp pain over the cardiac region. In all cases of myocarditis a sudden acceleration of the heart-action without an apparent exciting cause is often a prominent symptom.

From what should it be diagnosed?

From valvular cardiac disease, anæmia in adults or seniles, fatty heart, cardiac neurosis and hypertrophy, and dilatation of the heart following diseases of the abdominal viscera.

What is the treatment?

Treatment necessarily is only palliative. Only moderate exercise and a moderate amount of easily-digested food should be indulged in. Medical treatment, *per se*, is of little value. In cases of sudden heart failure ammonia, ether, or other cardiac stimulants may be used. In well-marked cases the use of strophanthus, digitalis, scoparius, or convallaria is of benefit where the patient can take it systematically under the care of the attending physician.

HYPERTROPHY AND DILATATION OF THE HEART.

What are hypertrophy and dilatation of the heart?

An increase in the thickness of the cardiac walls and of the capacity of one or all of the cavities of the heart.

What is the etiology?

These cardiac changes are generally caused by extreme physical exertion, by over-indulgence in food or alcoholic stimulants, and occasionally by congenital predisposition. Sudden dilatation of the heart sometimes occurs in the course of acute systemic affections.

What is the pathology?

The heart is increased in size and the cardiac walls are abnormally thickened. There is an increase in the capacity of the cardiac cavities. Upon minute examination the sarcous elements seem to be increased in size and number.

What are the symptoms?

The disease may exist for a long time without producing any marked *symptoms*, but physical examination will generally show an increase in the area of cardiac dulness, and sometimes a soft blowing murmur over the base of the heart, due to insufficiency of some of the valves. In almost all cases the symptoms are those of chronic endocarditis or myocarditis. The *course* of the disease is very slow, and disturbances of digestion, with the exception of constipation, are rarely marked.

What is the treatment?

Treatment is palliative, and must be directed to improving the patient's general condition and the administration of cardiac tonics. As long as compensation is efficient the patient will do well, provided he avoids sudden over-exertion. Care should be taken in the use of digitalis in all cases where the symptoms are not urgent.

FATTY HEART.

What is fatty heart?

A change in the muscular fibres of the heart, resulting in the replacement of the muscular elements by molecules of fat, and also generally attended by a deposition of fat between the bundles of muscular fibres.

What is its etiology?

It often accompanies prolonged cases of acute infectious disease. It also occurs in cases of chronic disease of the liver and kidneys or other diseases which by their continuance cause a strain of the heart-muscle.

What is its pathology?

As it is generally associated with dilatation, the size of the heart is apparently abnormal. The muscular portion often has a yellowish color, and on microscopic examination many of the sarcous elements are found to be replaced by molecules of fat.

What are the symptoms and treatment?

The *symptoms* of fatty heart itself are very indistinct, but it is generally accompanied by dyspnœa or slight pain in the cardiac region. On physical examination the area of cardiac dulness is generally found enlarged, and the intensity of the second sound exceeds that of the first. In almost all cases of fatty heart there are physical signs of fatty deposits in other organs.

Treatment is mainly symptomatic. Moderate cardiac stimulants may

be employed with care and regular physical exercise is often of benefit. As regards diet, all foods tending to increase the deposition of fat in the viscera should be avoided.

ANGINA PECTORIS.

What is meant by angina pectoris?

A sudden pain or spasm referred to the pericardial region, often extending to the left shoulder, and piercing in character.

What is its etiology?

It may occur as a complication of any cardiac disease, but it is most frequently found in cases of fatty degeneration of the coronary arteries.

What are its symptoms?

It is characterized by a sudden sharp pain in the præcordial region, often extending down the left arm, and attended with the mental sensation of impending death. The pulse is frequent, and irregular as to both force and frequency. The action of the heart is tumultuous; respiration is irregular and often gasping in character; the expression is anxious, and the face covered with a clammy sweat. The attacks generally last from a few moments to half an hour.

What is its treatment?

During the attack inhalations of amyl nitrite, chloroform, or ether may give relief. Counter-irritants and hypodermics of morphine or atropine should be used. As palliative treatment electricity or nitroglycerin internally is sometimes of benefit. *Prognosis* is always unfavorable.

TACHYCARDIA.

What is meant by tachycardia?

A nervous affection of the heart, characterized by a great increase in the number of heart-beats, paroxysmal in character.

What is its etiology?

Anæmia and plethora or over-indulgence in food or alcoholic liquors may cause it. It sometimes accompanies cardiac valvular disease. A senile condition is a predisposing factor.

What are the symptoms?

The paroxysms generally follow acute dilatation of the stomach from the ingestion of too much food or liquid. The patient is pale and nervous, but no dyspnœa is present. The heart-action is much increased, and murmurs (hæmic) are often heard over the situation of the great vessels. The cardiac sounds are arhythmic in character.

What is its treatment?

Tonic treatment is generally of benefit. Cardiac sedatives should be given between the attacks, and all excitements, mental or physical, avoided.

PERICARDITIS.

What is meant by pericarditis?

An inflammation of the membrane covering the heart and lining the pericardial sac.

What is its etiology?

It is rarely of primary origin. It may follow diseases of the blood of septic origin, or inflammation of the pericardial cavity from the extension into it of tubercular deposits or new growths. It also occurs as a complication of constitutional diseases or may be caused by external injuries.

What is its pathology?

The inflammation may be circumscribed or diffused over the entire lining membrane. As a rule, both surfaces of the pericardium are coated with an exudation which is serous, fibrinous, hemorrhagic, or purulent in character, with which the pericardial sac may be more or less filled. The exudation increases where the disease has existed for some time, adhesions form between the walls, and often the heart shows signs of muscular degeneration.

What are the symptoms?

Generally acute pericarditis occurs in the course of Bright's disease, acute rheumatism, the acute infectious diseases, or as a result of the extension of inflammation from neighboring parts. There are pain and tenderness in the cardiac region and irregular action of the heart. Occasionally the præcordial pain is very severe. Headache and coma sometimes occur, and also rigors. Fever is present, but its degree often depends upon the primary disease. There is dyspnœa, but the amount of it is generally proportionate to the distension of the pericardial sac with fluid. Respiration is accelerated, and the skin is pale and cyanotic. A short hacking cough is occasionally present. The pulse is quick and often irregular.

What are the physical signs?

On inspection the præcordial area is often abnormally prominent, and the apex-beat, although seen in the normal situation, is very faint. On percussion the area of cardiac dulness is greatly increased, dependent upon the amount of effusion. The area of dulness may change with the change in position of the patient. On auscultation the heart-sounds are generally heard very faintly, with accentuation of the second sound. Over the

base a fine friction murmur is heard. On auscultation, should the stethoscope be pressed upon the situation of the apex-beat, an exocardial friction sound is heard with both systole and diastole.

In cases of chronic pericarditis there may be retraction of the left side of the chest, specially marked at the cardiac systole, due to adhesion of the two pericardial surfaces. There is diminution of the pulse on inspiration, and the exocardial friction sound is likewise heard.

From what should it be diagnosed?

It may be mistaken for cardiac neurosis due to anæmia or other wasting disease, myocarditis, aortic or mitral stenosis, or dilatation of the aorta.

What is the prognosis?

In acute idiopathic cases recovery often occurs, but where the disease complicates other troubles, or where the effusion is very great, *prognosis* is very grave. Pericarditis occuring in the course of tuberculosis or neoplasms is always fatal; also where the disease occurs as a result of the extension of inflammation from neighboring organs the lesion is often fatal. Chronic cases often last a long time, but sooner or later terminate in death, owing to increasing interference with the heart's action and the resulting changes in that organ.

What is the treatment?

When the disease occurs as a complication of rheumatism, acute rheumatic treatment is of the most benefit; absolute rest should always be insisted upon; cold applied to the pericardial region is of value. In cases of weak heart digitalis or other cardiac stimulants should be used. Morphine or other narcotics should be given to ensure rest, and in the first stages of the disease tincture of aconite or veratrum in drop doses, frequently repeated, will be of benefit; but the patient must be kept constantly under observation. The diet should be of the most nourishing character, given often and in very small quantities. In cases of rapid or great amount of effusion aspiration of the pericardium may be necessary. This should be performed with the patient reclining: the needle should be inserted through the skin in the interspace between the fourth and fifth ribs, an inch and a half to the left of the sternum. The skin should then be pulled outward, and the needle pushed into the pericardial cavity. Care must be exercised to always have a vacuum in the aspirator, and to withdraw the point of the needle into the trocar as soon as it has penetrated the pericardial sac. Also, should there be any dyspnœa or a sudden failure of the pulse, no more fluid should be withdrawn. In cases of purulent pericarditis, where aspiration has not proved of benefit, continuous drainage *in vacuo* may be necessary, or as a last resort resection of the rib with permanent opening of the pericardium.

HYDROPERICARDIUM.

What is meant by hydropericardium?

An increase in the normal amount of the pericardial fluid, without any inflammation of the pericardium itself. This fluid is generally albuminous in character.

What are the causes, signs, and treatment?

It is secondary to other diseases attended by venous stasis or anæmia. The area of cardiac dulness is increased, but there is no friction sound. There may be a weak heart-action or dyspnœa, depending upon the amount of the effusion. *Prognosis* and *treatment* will depend upon the causative disease.

HÆMOPERICARDIUM.

What is meant by hæmopericardium?

An accumulation of blood in the pericardial sac.

What are the causes, signs, and treatment?

It is caused by the bursting of small blood-vessels in neoplasms, involving the pericardium, from the bursting of aneurisms, or from direct injuries to the pericardium and heart. The signs are those of an accumulation of fluid in the pericardium. *Treatment* will be directed to the primary trouble.

PNEUMOPERICARDIUM.

What is meant by pneumopericardium?

The presence of air in the pericardial sac. It follows direct wounds or perforation of the pericardium caused by the extension of ulceration from the neighboring organs.

What are the symptoms?

They are the same as those of hydropericardium, but cardiac dulness is often absent, and a succussion sound is heard with the movements of the heart; also the pulse becomes suddenly weak and urgent dyspnœa occurs.

What is the treatment?

Treatment should be symptomatic, tending to increase the comfort of the patient by position and stimulants.

Diseases of the Vessels.

ENDARTERITIS.

Syn.—Arterio-sclerosis; Atheroma.

What is meant by endarteritis?

A degenerative change in the interior and middle coats of the arteries, with a consequent thickening, followed by ulceration and the formation of thrombi.

What is its etiology?

It is chiefly met with in people over forty years of age. The alcoholic habit, syphilis, gout, lead-poisoning, and nephritis also predispose to it. The disease usually affects the arteries, but occasionally the veins are also affected.

What is its pathology?

The cells of the lining coat of the artery are degenerated, and a deposit of gelatinous, and later on calcareous, material takes place in them. The thickened affected areas break down and ulcerate, and the fibrin of the blood is deposited upon them, giving rise to thrombi. The elasticity of the arterial walls is lost, and they sometimes give way in places, causing small aneurisms to form. Owing to the loss of elasticity of the arteries an extra pressure is put upon the heart, and it in consequenee becomes hypertrophied. As a result of these changes large organs are often found in a state of fatty degeneration, due to disturbances of nutrition.

What are the symptoms?

On inspection the superficial accessible arteries are found to give a hard, incompressible sensation to the touch, and they seem to follow a more tortuous course than is normal. On physical examination there are generally found the signs of cardiac hypertrophy and the second sound is accentuated. There are also often found the weak cardiac sounds of myocarditis, due to sclerosis of the coronary arteries. The *symptoms* vary according to which arteries are most affected—viz. in the brain there may be hemorrhage from rupture of the diseased vessel, or cerebral softening, due to partial or complete occlusion of the blood-vessels, due to thrombi. In the kidneys there will be signs of chronic diffuse nephritis, with a decrease of the blood-supply. When the arteries of the heart are mainly affected there is a slow, hard, weak pulse, sometimes dyspnœa, and often œdema of the extremities. The pulse is often irregular. In all cases there are generally more or less headache and tendency to somnolence. Attacks of vertigo often occur. Temperature may be subnormal. The lesion is frequently attended by gastric and intestinal dyspepsia. The patient may live for many years with the dis-

ease, the principal danger being formation of thrombi and consequent occlusion of an important artery.

What is the treatment?

Treatment is purely symptomatic, but particular attention should be paid to abstain from alcohol and over-feeding, and to keeping the heart in its best condition by means of suitable cardiac tonics.

ANEURISM OF THE AORTA.

What is aneurism of the aorta?

A dilatation of a portion of the aorta, due to degeneration of the internal coat of the arterial wall, and rarely having an injury as an exciting cause.

What are its etiology and pathology?

Violent exercise, syphilis, gout, and lead-poisoning predispose to it. The dilatation varies greatly in size and shape. The eroded portion of the arterial wall is generally covered by several consecutive layers of coagulated blood, which often causes a narrowing of the lumen of the aorta. The ascending portion of the arch is that most commonly affected. According to shape of the sac and degree of dilatation these aneurisms are generally called cylindrical, fusiform, sacculated, or dissecting.

What are its symptoms?

On inspection, if the aneurism be near the thoracic wall or have caused absorption of the bony parts, an abnormal pulsation is often visible. If it is in the descending portion of the arch, this is sometimes seen in the back; a distinct swelling is also seen over the situation of the aneurism. On percussion there is dulness over the dilated artery. On auscultation a peculiar loud blowing murmur of a systolic character is generally heard. The pulse may be uneven in the radials, and signs of dilatation of the left ventricle are often present. The large veins of the neck are frequently dilated; a purring thrill is often evident on pressure. There may be more or less dyspnœa, loss of voice, difficulty in breathing, pain in the arms or intercostal spaces, and dysphagia. These symptoms are of course due to pressure on the neighboring nerves and organs. In cases of aneurism of the transverse and descending portion of the arch a sharp boring pain in the back over the situation of the first two dorsal vertebræ is often present, due to pressure on and erosion of the vertebræ.

What is the prognosis?

Prognosis is fatal, but patients sometimes live for a few years after it is discovered. Sudden death may occur from rupture into the pericardial sac or any of the neighboring passages. Death also occurs from pressure on the trachea or nerves of the heart, and in rare cases from increasing weakness.

From what should it be diagnosed?

From mediastinal tumors, from hypertrophy of the sternum or costo-sternal articulations, and from bronchial and pulmonary growths.

What is its treatment?

Obliteration of the sac has as yet been unsuccessful: absolute rest in a supine condition, restricted diet, and large doses of iodide of potash have been followed by the best results. Acupuncture and galvano-puncture and the introduction of fine wire into the sac to favor coagulation have been tried. Opiates may be given for the relief of pain; in cases of rupture nothing can be done.

THORACIC ANEURISMS (NOT AORTIC).

Where do these most frequently occur?

In the innominate, common carotid, and first portions of the subclavian arteries.

What are the diagnosis, symptoms, and treatment?

All symptoms and diagnoses are similar to those of aneurism of the arch of the aorta, only differing in the fact that in aneurism of the subclavian and carotid arteries the swelling, pulsation, and thrill are manifested earlier in the disease than in cases of aortic aneurism. The *symptoms* due to compression of neighboring nerves or organs are the same as those of the aortic form. As regards *treatment*, if systemic it is the same as that of aortic aneurism. Locally, ligature of the common carotid or of the external and internal carotid, and also of the second or third portion of the subclavian, has sometimes proved of temporary benefit.

ANEURISM OF THE ABDOMINAL AORTA.

What is aneurism of the abdominal aorta?

A dilatation somewhere in the course of the aorta from the diaphragm to its bifurcation at the fourth lumbar vertebræ.

What are its etiology, pathology, and symptoms?

Its *etiology* and *pathology* are the same as those of all other aortic aneurisms. It is most frequently found near the cœliac axis. It is generally fusiform in character; occasionally it is saccular, but often the dilatation is more marked on one side of the median line. As a rule, all *symptoms* are caused by compression of the neighboring organs. On physical examination inspection shows pulsation above the umbilicus (but this is rare). On auscultation a blowing murmur synchronous with the pulse is heard: occasionally on deep palpation a marked tumor over the situation of the aorta is manifest, but this symptom is often absent. Disturbances of digestion, such as gastric or intestinal dyspepsia, or slight jaundice, are generally found. Occasionally pressure on the

plexus in the neighborhood of the aneurism may cause attacks of apparent hepatic or renal colic. Owing to pressure on the renal veins and those leading to the liver the urine is generally scanty, of high specific gravity, and shows an excess of indican.

What is its diagnosis?

It may be mistaken for abdominal growths overlying the aorta, for chronic dilatation of the stomach, or for accumulation of fæcal matter in the transverse colon; but expansile pulsation felt on palpation is of most diagnostic value.

What is its treatment?

General treatment is the same as that of aortic aneurism. *Local treatment* by means of galvano-puncture or the introduction of foreign bodies into the sac (Loreta) has been followed by better results than in cases of aortic aneurism. A permanent cure has never been obtained; therefore the *prognosis* is always very grave.

DISEASES OF THE DIGESTIVE ORGANS.

Diseases of the Mouth.

STOMATITIS.

What is stomatitis?

An inflammation of the membrane covering the cavity of the mouth.

What is its etiology?

It is most commonly caused by mechanical and chemical irritants, such as scratches from the sharp edges of carious teeth or the ingestion of irritating, alkaline, or acid solutions; it also often occurs from the ingestion of mercurial preparations or from the extension of inflammation from the neighboring cavities. Want of cleanliness in the mouth is the most marked predisposing cause.

What is its pathology?

The mucous membrane lining the mouth is intensely red and swollen, especially that of the alveolar processes. It may be covered in patches or generally with mucus or muco-pus in the most severe cases; there are spots of ulceration, frequently covered by a false membrane. The tongue is coated on its upper surface with a layer of new cells, mucus, and pus which contains large numbers of bacteria. The papillæ are very prominent and enlarged.

What are the symptoms?

There is generally loss of appetite; the breath is offensive, owing to decomposition of retained secretions. Patches of ulceration in children are often seen on the buccal mucous membrane, and in adults along the alveolar process surrounding the base of the teeth. The gums are red

and swollen and bleed easily. The secretion of the salivary glands is much increased, and the lymph-glands and the submaxillary and parotid regions are often enlarged. Pain on deglutition is often marked, and in cases of the disease in children there may be more or less rise of temperature. At the onset of the disease there is often a feeling of heat and dryness in the mouth.

What is its treatment?

Strict attention to cleanliness of the mouth is of most importance. The condition of the bowels should receive careful attention, and saline cathartics may be used for this purpose. The diet should consist of the most easily digestible foods, given in moderate quantities. Locally in mild cases a mouth-wash of tincture of myrrh is often sufficient. In cases attended by ulceration or the formation of fibrinous membrane frequent swabbing of the affected parts with compound tincture of benzoin or with solutions of nitrate of silver (10–20 grains to ℥j) is of benefit. In slight cases the milder antiseptic solutions, locally applied, will effect a cure.

ULCERATIONS OF THE MOUTH.

What are the causes?

Syphilis, gastric disturbance, and acute irritants.

What is the treatment?

The ulcer should be swabbed with a solution of 10–20 per cent. chromic acid in water, then washed off, and a mild antiseptic mouth-wash (1 : 100 carbolic acid, saturated solution of boracic acid, thymol 1 : 300).

GLOSSITIS.

Syn.—Inflammation of the tongue.

What is its etiology?

The acute form is caused by traumatism or it occurs as a complication of acute septic inflammation of the neighboring parts. The chronic form is often limited to a portion of the tongue, and is induced by long-continued irritation from sharp points of the teeth or other mechanical irritants. In the chronic form there is often an ulceration of the hypertrophied portion.

What is its pathology?

The tongue is very much swollen, often to double its size, is dark in color, and is covered with a thick purulent coating. In the acute form it often presents a glazed appearance. In the chronic form the affected portion of the tongue is enlarged, darker in color than normal, and on section the parenchymatous elements are found increased both in number and size.

What are its symptoms?

Owing to the excessive swelling of the tongue the patient is obliged to keep the mouth open, from which the end of the tongue protrudes; salivation is marked, and also enlargement of the cervical and sublingual glands. There may be great pain, and talking and deglutition are very difficult; mastication is often impossible. The face is cyanotic, and considerable dyspnœa is present. The pulse is quick and small, but the amount of the fever generally depends on the exciting disease. The under surface of the tongue is often eroded, due to its continued pressure against the teeth.

What is its treatment?

In the acute form incision into the dorsum gives the most prompt relief. The local use of small pieces of ice may give comfort. After-treatment is the same as that of stomatitis.

LEUCOPLASIA.

What is leucoplasia?

A limited hyperplasia of the superficial epithelium of the tongue and cheeks, producing spots of a dull-white appearance.

What are its cause and treatment?

It is chronic in character, and gives rise to little discomfort, and, as it is limited in area, little importance is generally attached to it. The spots may disappear, but soon the original area is again invaded. Excessive use of tobacco seems to act as a predisposing cause. Occasionally fissures appear on the affected portions of the tongue. Care should be taken to diagnose this condition from the mucous patches of syphilis.

Treatment seems to be of little benefit, but the constant use of antiseptic mouth-washes—particularly carbolic acid—is recommended.

Diseases of the Œsophagus.

ŒSOPHAGITIS.

What is œsophagitis?

An inflammation of the mucous membrane and underlying tissues of the œsophagus, which may be of a catarrhal, croupous, or purulent nature.

What are its etiology and pathology?

All forms of this disease generally occur as complications or extensions of other diseases. The catarrhal form is usually produced by an irritant of a chemical or mechanical nature or by venous congestion due to external pressure. If acute, the epithelium of the mucous membrane is thrown off very rapidly, and this is attended by a large amount of excretion. If the disease becomes chronic, slight thickenings of the mucous

membrane may form in places, and slight œsophageal ulcers are sometimes found. The croupous and diphtheritic forms usually occur as extensions of these processes from the pharynx or upper air-passages. The purulent form is generally caused by the irritation of strong acids or the presence of foreign bodies. It also occurs as a result of extension of inflammation from the pockmarks of variola. The pus accumulates in the submucous layer of the œsophagus and narrows the passage; occasionally the mucous membrane sloughs away over the affected portion, leaving large ulcers. In cases of recovery the healing of these ulcers frequently gives rise to stricture.

What are the symptoms and treatment?

Constant pain is only marked when the disease assumes a severe form. More or less pain on swallowing is always present. The pain may be referred to between the shoulder-blades or over and below the thyroid cartilages. Fever and acceleration of pulse are generally slight, but intense thirst is often a prominent symptom. In some cases all solid food is regurgitated. In all cases care should be taken not to confound this disease with those caused by external pressure on the œsophagus. The disease is treated symptomatically. If a foreign body has caused the affection, an effort should be made to remove it. In cases of chemical irritants their proper antidotes ought to be administered. In all cases liquid diet is advisable, and this is best given through a soft stomach-tube. For the pain small hypodermics of morphine should be used. The swallowing of small particles of ice and the application of cold externally often give much comfort.

DILATATION OF THE ŒSOPHAGUS.

What is dilatation of the œsophagus?

A sac-like enlargement of a portion of the œsophagus.

What are its etiology and pathology?

It frequently follows stricture near the cardiac orifice of the stomach. The muscular wall of the œsophagus becomes more or less paralyzed, and dilatation of the passage soon causes chronic catarrhal inflammation of the mucous membrane of the œsophagus. Pressure from an enlarged gland in the neighborhood of a weakened spot in the muscular layer of the œsophagus, external injuries, causing pressure upon the same, and obscure causes, also give rise to it. The enlargement, when circumscribed in the form of a diverticulum, often increases rapidly until the pouch becomes enormous in size. The most frequent seat of the affection is at the junction of the pharynx and œsophagus, on the posterior wall of the latter. The walls of the affected portion are frequently thickened. The thickening is apparently due to increase of the mucous and submucous layers, giving rise to the appearance of a rupture through the muscular coat of the œsophagus.

What are the symptoms and treatment?

If the dilatation is slight and uniform, the *symptoms* may be those of only slight gastric dyspepsia. Should the dilatation be sacculated, there is more or less increasing difficulty in deglutition. Owing to food lodging in the pouch, regurgitation is often present. Frequently a small portion of food is left in the diverticulum and decomposes, giving rise to a foul odor of the breath. In cases where the pouch is very large the distension of it by food may cause compression of the lumen of the œsophagus and gradual starvation. Where the dilatation is due to traction from the adhesion to bronchial glands, painful deglutition is generally marked. Pain is felt at a certain point in the course of the œsophagus, and should these glands soften down, ulceration and perforation of the œsophagus frequently occur. In these cases regurgitated food or liquid is often mixed with pus and streaks of blood. In the mild forms the disease may last for years. Dyspnœa and disturbance of the circulation are always present in advanced cases.

Treatment is directed chiefly toward supporting the vital forces of the patient, and in many cases rectal alimentation may be necessary. Where the dilatation is due to stricture, treatment is the same, with the addition of that for the stricture itself.

STENOSIS OF THE ŒSOPHAGUS.

What is meant by stenosis of the œsophagus?

A contraction of the lumen of the œsophagus.

What are its etiology and pathology?

It may be caused by carcinoma or sarcoma of the œsophagus, by the contraction of cicatrices following ulcers of the œsophagus, by compression caused by tumors external to the œsophagus, and by pressure from aneurisms or from hypertrophy of the walls of the œsophagus following chronic inflammation. It is most commonly met with in the lower third of the passage, above the constricted portion. The mucous coat is usually hypertrophied and the lumen increased, due to the increased exertion of forcing food through the obstruction. Below the contraction the walls are often thinner than normal.

What are the symptoms?

The *symptoms* at first are very indefinite. In mild cases deglutition is but slightly interfered with, but this gradually becomes more difficult, especially as regards swallowing solids. The difficulty and slight pain felt on deglutition are generally referred by the patient to a point beneath the manubrium. After a time regurgitation of food begins, and this frequently takes place some hours after meals. Should the constriction be marked, there is progressive emaciation, with the attendant signs of approaching starvation. The passage of an œsophageal bougie will often confirm the diagnosis.

What are its prognosis and treatment?

Prognosis will depend greatly on the primary cause of the stricture. Where the stricture is due to ulceration caused by the passage of foreign bodies or chemical irritants the case may be improved, but in the majority of patients the disease gradually progresses to a fatal issue. Medical *treatment* is limited to feeding the patient through a stomach-tube or the rectum and the frequent and systematic passage of a flexible bougie. Should these measures be of no benefit, the case should be referred immediately to a surgeon.

CANCER OF THE ŒSOPHAGUS.

What are the etiology and pathology of cancer of the œsophagus?

It is quite frequently met with, and is caused by continued irritation of the mucous membrane. It is generally situated in the lower or middle thirds of the œsophagus, and surrounds it in a ring-like manner. The new growth on examination is found to consist of the elements of scirrhous or medullary cancer, and to spring from the submucous layer.

What are its symptoms?

It generally occurs in people of advanced age. In a few cases *symptoms* are not marked, but the patient shows progressive emaciation and exhaustion. In other cases the symptoms are those of stenosis of the œsophagus, which gradually increase in severity, but the thoracic and œsophageal pains are more severe, the emaciation more rapid, and the cachexia more marked than in non-malignant stenosis. When vomiting occurs the ejected matter may contain cancer-cells.

What are the treatment and prognosis?

Treatment can only be directed to the relief of painful or urgent symptoms. The disease is incurable, the patient succumbing to it in a year or a year and a half. Surgical measures for the extirpation of the growth have been tried without success.

RUPTURE OF THE ŒSOPHAGUS.

What are the causes, symptoms, and treatment?

The disease is a rare occurrence. It most frequently is caused by the softening of cancerous growths or ulcers which have weakened the wall of the œsophagus. The attack is frequently preceded by nausea and vomiting, and during this act a sudden severe pain is felt along the course of the œsophagus. Symptoms of collapse, as a pale face, cold perspiration, and feeble pulse, occur. Emphysema of the neck frequently takes place, and should the perforation be into any of the large blood-vessels, there is vomiting of blood. Death rapidly ensues.

SPASM OF THE ŒSOPHAGUS.

What are its etiology, symptoms, and treatment?

It is due either to central disorder of that portion of the nervous system governing the parts or to local irritation caused by the ingestion of irritant poisons. It is characterized by an inability to swallow on effort. Care should be taken to diagnose from permanent constriction by means of etherizing the patient and passing the œsophageal bougie.

Treatment will be directed to the primary cause of the disorder.

PARALYSIS OF THE ŒSOPHAGUS.

What are the causes and treatment?

It is quite rare, and follows diphtheria or disease of the nerves supplying the constrictors of the œsophagus.

Treatment will be directed to the primary disease where the cause is ascertainable. If of diphtheritic origin, injections and the internal use of strychnine have proved of benefit.

Diseases of the Stomach.

ACUTE GASTRITIS.

What is acute gastritis?

An acute inflammation of the mucous membrane of the stomach.

What are its etiology and pathology?

It is due to injury of the mucous membrane caused by the ingestion of too hot or too cold food, or from mechanical or chemical irritants. All patients with fever, or weak, anæmic, or badly-nourished persons, are predisposed to it. It is of very frequent occurrence, brief in duration, and generally ends in recovery. The mucous membrane of the stomach is swollen and dark-red in color, and covered with a coating of thick, glairy mucus from excessive secretion of the mucous glands.

What are the symptoms?

It begins with general malaise, anorexia, and a slight nausea. The sense of taste is diminished or totally lost. The patient has chilly sensations, is nervous, and often experiences great thirst. A feeling of pressure in the region of the pit of the stomach is often present. The breath has a foul odor, the tongue has a thick coating, and eructations of gas take place. There may also be headache or vertigo. Constipation generally prevails, and the urine is high colored. Fever is usually slight, but may be marked in cases due to the ingestion of irritants. Vomiting is present, and the vomited material is first that of the ingested food, followed by bile and mucus. In children vomiting and high fever are marked symptoms, and there is often great restlessness at night, and occasionally there is delirium.

What is the treatment?

Great care must be given to the diet to prevent recurrence in those predisposed. At the onset of the attack an emetic of mustard and water, hot water, or in children syrup of ipecac, is advisable. Should the disease have existed for some days, this should be followed by the administration of a carthartic. The diet should be restricted, and also the amount of fluid allowed. For the pain in the epigastrium and vomiting counter-irritants to the pit of the stomach, small doses of opium, and small pieces of ice internally give relief. The fever, except in children, rarely requires active measures. In such cases, hot baths, followed by small doses of phenacetin or the bromides, have a good effect.

CHRONIC GASTRITIS.

What is chronic gastritis?

An inflammation of the mucous membrane of the stomach, which runs a chronic course.

What is its etiology?

It may follow repeated attacks of acute gastritis, or may be caused by improper diet or constant irritation from ingestion of alcohol: chronic interstitial hepatitis, which produces congestion of the portal circulation, is also a frequent cause. Chronic gastritis is often associated with phthisis and cancer of the stomach.

What is its pathology?

The mucous membrane of the stomach is dark brown in color and increased in thickness. The gastric glands are enlarged, and the inner surface of the stomach is coated with whitish mucus.

What are the symptoms?

As the gastric juice is diminished in quantity, fermentation is apt to occur, causing irritation of the mucous and submucous layers. As a result of this, peristalsis is less vigorous than normal; there are marked eructations of gas, and often pain in the pit of stomach. Anorexia and bad taste in the mouth are generally present. Owing to distension of the stomach marked prominence of the epigastric region often exists. In old cases there are nausea and vomiting of partly-digested food during the day, and vomiting of a watery, sour-tasting material in the morning. If the disease extend to the intestines, constipation, passing of intestinal gas, progressive emaciation, impairment of general nutrition, and attacks of vertigo occur. The patient also becomes hypochondriacal. Cases differ much in severity, and may last months or years. In those long continued, ulcerative hemorrhage of the stomach may occur.

What is the treatment?

The regulation of the diet is of primary importance. All spirituous

liquors, spiced dishes, coarse vegetables, fatty foods or much of the carbonaceous foods, should be prohibited. A milk diet with alkaline waters to drink is excellent. Meals should be eaten frequently, and should be small in quantity. As regards drugs, the use of carbolic acid or tincture of iodine in drop doses, or of salicylic acid in 10-grain doses, will be of benefit in preventing fermentation.

Washing out of the stomach twice or three times a day by means of a stomach-pump or siphon will often cure mild cases. Occasionally the essence of pepsin, pancreatine, or hydrochloric acid may be necessary to aid digestion. Should the epigastric pain and attacks of vomiting cease, the use of bitter tonics will hasten the cure. The use of various "test-meals," to ascertain the amount of gastric secretion and the form of food which is most easily digested, often shows the line of treatment to be followed in the case in question.

PHLEGMONOUS GASTRITIS.

What is phlegmonous gastritis?

A purulent inflammation of the submucous membrane of the stomach, gradually extending to all the other layers.

What are its etiology, symptoms, and treatment?

It is very rare in occurrence, and sometimes complicates the various diseases of pyæmic origin. The *symptoms* are those of acute gastritis added to symptoms of pyæmia. It is usually fatal, on account of the primary disease. Narcotics should be given for pain, ice for the thirst, and stimulation for weak pulse or general prostration.

GASTRITIS CAUSED BY POISONING.

What is the effect of poisoning on the stomach?

After the ingestion of strong caustics the mucous membrane of the stomach is often softened, from the chemical action. After the ingestion of acid poisons there may be softening or charring of the mucous membrane. Should a mineral poison be taken, the symptoms are not so immediate, but soon the symptoms of acute gastritis set in, attended by apparent paralysis of the stomach. In all cases there are generally cough and dysphagia, arising from the injury to the throat and œsophagus. There are also severe pain in the epigastrium, spreading over the abdomen; bloody vomiting, generally attended with purging; a small, frequent pulse and other signs of collapse.

What is the treatment?

Treatment consists in the prompt use of emetics, followed by the proper antidotes.

GASTRIC ULCER.

What is gastric ulcer?

A localized inflammation of the mucous membrane of the stomach, causing a loss of the mucous and submucous tissue in the affected spot.

What is its etiology?

It is caused by an impairment of circulation in some spot of the surface of the stomach, and as a consequence of this the acid gastric juice, not being counteracted by the alkaline blood, attacks the part and produces softening, followed by erosion. This often occurs in cases of phthisis, anæmia, alcoholism, or as a result of embolism. It is most frequently met with between the ages of eighteen and twenty-eight, and is more frequent in females than in males.

What is its pathology?

The ulcer differs in size, but usually presents sharp borders and extends through to the muscular layer of the stomach. It is generally single and situated on the posterior wall of the pyloric extremity. Should recovery take place and the ulcer be situated near enough to the pyloric orifice of the stomach, contraction of the cicatrix may cause stricture of the pylorus. In cases where the ulcer extends through the muscular coat an inflammation of the neighboring tissues is frequently set up, causing peritonitis or adhesions of the surrounding parts.

What are the symptoms?

In a few cases no marked *symptoms* are present during life. In others sudden hemorrhage from perforation of a blood-vessel, or peritonitis from perforation of the stomach, first draws our attention toward the disease. Generally the case begins with slight disturbance of digestion, a feeling of fulness in the epigastrium, eructation of gases, and pain in the epigastrium of a sharp and intermittent character. This pain may be diffused over the region of the stomach or localized. The attack of pain only lasts a few hours, but is often attended by tenderness on pressure. There are generally frequent attacks of vomiting, which are unaccompanied by blood unless a blood-vessel has been eroded. In these cases nausea is almost constant, and the patient vomits blood of a dark color or blood and food mixed. Constipation is generally present, and the stools frequently contain disorganized blood. Where perforation occurs the patient is seized with a sudden severe pain, quickly followed by all the symptoms of acute general peritonitis. Appetite is either unimpaired or irregular as to amount. Pulse and temperature are not affected, as a rule, by the disease. Should the ulcer perforate into the pleura or invade the liver, collections of pus in one organ or the other will give their typical symptoms.

What is the diagnosis?

Careful attention to the history of the case will be of great assistance.

In cases where blood has been ejected, if it comes from the stomach it will usually be dark in color, acid in reaction, mixed with food, and clotted. This is not true of blood ejected from the lungs, unless it has been swallowed and retained in the stomach for some time. If hæmatemesis has not occurred, the diagnosis will always be difficult, but especial care on physical examination should be taken to ascertain the presence of a tumor, which either might be an aneurism or cancer of the stomach or fæcal masses in the transverse colon or fatty tumor pressing upon the walls of the stomach.

What is the treatment?

The principal *treatment* is careful regulation of the diet. This should consist of the most nutritious liquids, such as milk, meat soups, or extracts of beef. Internally, small doses of bismuth subnitrate, nitrate of silver, or morphine may be given. In obstinate vomiting counter-irritation to the epigastrium, drop doses of carbolic acid, or tincture of iodine give relief. In obstinate cases rectal alimentation exclusively may be necessary. In all cases absolute rest should be insisted upon.

CANCER OF THE STOMACH.

What is cancer of the stomach?

A malignant growth of a primary or secondary nature, affecting the walls of the stomach, and generally situated at the pyloric end or along the lesser curvature.

What is its etiology?

The primary *cause* is unknown, but some believe that the tendency to it is hereditary. It is most frequent between the ages of fifty and sixty, and more frequent in women than in men. The cicatrix of a gastric ulcer often seems to serve as a starting-point. Irritants, errors in diet, and the abuse of alcohol are said to predispose toward it.

What is its pathology?

It apparently begins in the mucous layers, and then spreads through all the other layers of the stomach. It may have the soft or scirrhous form. Rarely the form of nodular infiltration is found. In the soft variety the disease is often complicated by the presence of ulcers.

What are the symptoms?

It begins, as a rule, with the signs of gastric dyspepsia, to which are added progressive emaciation and cachexia. The patient generally complains of a fulness in the stomach after meals; occasionally cardialgia, eructation of gases, and vomiting. Should the disease have advanced to any degree, the vomited matters consist of decomposed food and blood of a coffee-ground appearance. Physical examination in almost all cases reveals the presence of a tumor in the epigastrium. This tumor varies much in size. There is also detected a marked dilatation of the stomach.

Emaciation and gastric symptoms increase progressively, and in advanced cases there may be secondary deposits in the other abdominal organs or enlargement of the lymphatic glands. In the ulcerative form of cancer peritonitis or hepatitis may be caused by perforation of the gastric wall. The disease lasts from a few months to two years, but always terminates fatally. Temperature and pulse are generally unaffected by the disease.

What is the diagnosis?

It should be diagnosed from cancer of the liver, pancreas, omentum, and transverse colon by the difference in the situation of the tumor and the general feeling of hardness in the epigastrium; also by the character of the vomit and the possible presence of cancer-cells (if of the soft variety) in it. It may be simulated by extensive ulcer of the stomach, and the cancerous cachexias by profound or pernicious anæmia.

What is the treatment?

An easily-assimilated, nutritious diet should be given, and where possible the stomach should be washed out regularly, and the patient's strength supported by tonics. In the early stages of a few cases operative interference may prolong life.

HEMORRHAGE FROM THE STOMACH.

Syn.—Hæmatemesis.

What is its etiology?

The most frequent *causes* are gastric ulcer, gastric cancer, or cirrhosis of the liver. Hæmatemesis also occurs as a result of thrombosis in the portal system or from the bursting of a varix or aneurism into the stomach. Less frequently it occurs in blood diseases, such as scurvy, purpura hæmorrhagica, or leukæmia, more rarely as a result of acute yellow atrophy of the liver, traumatism, or the irritation due to strong corrosive poisons or foreign bodies. In the newborn it is sometimes met with in the affection called melæna neonatorum.

What are the symptoms?

The patient has a feeling of oppression in the region of the stomach. The face is pale, the skin cold and moist, the pulse small and frequent, and nausea is generally present. There may be syncope. In many cases the blood is all discharged through the bowels. In some cases the symptoms mentioned are followed by violent vomiting of effused blood. This blood is often dark and clotted, but its appearance often varies with the cause producing the hemorrhage. The attack of bleeding itself is rarely fatal.

What is the treatment?

At the time of the hemorrhage the patient should be placed flat upon the back, with the feet slightly elevated, absolute rest be enjoined, and cold applied externally to the epigastrium. Ice in small pieces may be

given by the mouth, and hypodermic stimulation or small doses of morphine hypodermically in cases where collapse occurs. After the acute symptoms pass off a purge should be administered to remove the remainder of the blood from the stomach and intestines. Other treatment will be that of the underlying disease.

DILATATION OF THE STOMACH.

What is dilatation of the stomach?

An abnormal expansion in the capacity of the stomach.

What is its etiology?

It is most frequently caused by obstruction at the pyloric orifice of the stomach, and is generally due to a new growth or cicatrix of an ulcer in this situation. Pressure from external tumors may also compress the pylorus. It is also sometimes caused by habitual over-eating or the ingestion of very large quantities of fluids.

What is its pathology?

The muscular fibres seem to be at first increased, but as the constriction becomes marked dilatation and apparent thinning of the gastric walls take place. Owing to the food being retained in the stomach for a long time, it decomposes, and causes chronic inflammation of the mucous membrane.

What are the symptoms?

The symptoms are mainly those of chronic gastritis, but the vomiting which takes place brings up a very great quantity of semi-digested food, some of which has often been eaten three or four days previously. In a few cases there may be protuberance of the epigastrium or of the lower ribs, caused by the distended organ, and occasionally the peristaltic movement can be felt. More or less emaciation is present. Constipation exists, and the urine is small in amount.

What is the treatment?

In mild cases not dependent on malignant origin dietetic measures, with the use of the various digestive agents, may effect a cure. In more pronounced cases systematic washing out of the stomach (lavage) by means of a flexible bougie is of great benefit. The solution used may contain bicarbonate of soda or salicylic acid or some alkaline water. Where the disease is caused by marked constriction of the pylorus surgical measures will be necessary. A diet limited to dry bread is often given.

NERVOUS DYSPEPSIA.

What is nervous dyspepsia?

A disturbance of the gastric function, due to a nervous condition, and not dependent upon any perceptible change of structure.

What is its etiology?

Sudden excessive mental emotions, long continued or often repeated, or melancholia, hysteria, and the first few months of pregnancy, often give rise to it.

What are the symptoms?

The *symptoms* are those of acute gastritis, such as anorexia, nausea, vomiting of mucus and bile, epigastric pain, and increased peristalsis. To these are added the symptoms of the underlying disease.

What is the treatment?

The patient should be encouraged, a full diet allowed, a change of surroundings ordered where feasible, and cold-water sponging administered. A bitter tonic is sometimes of benefit, but internal remedies should be used with caution. Other treatment would be that of the causative disease.

Intestinal Diseases.

CATARRHAL ENTERITIS.

What is catarrhal enteritis?

An acute inflammation of the intestinal membrane, general or limited in extent.

What is its etiology?

It may be caused by improper food, ingestion of poisons, chemical or mechanical irritants. It often accompanies severe infectious diseases or obstruction to the circulation in the liver, respiratory organs, or peritoneum.

What is its pathology?

The inflammation occurs most frequently in the large intestine. The mucous membrane is red and swollen, secretion is increased (sometimes it is purulent), the glands are enlarged and occasionally ulcerate. In chronic cases there is an atrophy of the mucous membrane.

What are the symptoms?

Diarrhœa is the most frequent *symptom*. At first the movements have a fæcal appearance, but this gradually changes to a green color and more liquid consistence. This latter is due to increased peristalsis, on account of which the food does not stay long enough in the large intestine to consolidate. Large quantities of offensive gases escape from the bowels, and there are gurgling noises in the intestines, due to this cause. Abdominal pains of a paroxysmal, colicky character are present. There are slight fever, loss of appetite, sometimes vomiting, and if the disease exists a length of time the general health is much impaired. Should

the enteritis be situated high up in the small intestine, diarrhœa may be absent, but there is frequently catarrh of the stomach, and the stools contain hyaline mucus and particles of undigested food. Jaundice often occurs in these cases. Where the enteritis is situated in the large intestine, the stools are very thin, and may consist entirely of mucus and pus. The abdomen is tender to the touch, especially along the course of the colon. In cases of catarrh of the rectum the passages are preceded by severe pain, burning and cutting sensations, and spasms of the sphincter. The stools consist mostly of mucus mixed with blood and pus, and there is a constant desire for evacuation. The acute form of enteritis may become chronic, especially in children, but the chronic form occasionally occurs primarily. The symptoms are those of acute enteritis, but fever is not as marked and the emaciation is more pronounced. A cachectic appearance is generally seen, and mucous casts of the intestinal tubes often appear in the stools. Mental depression is also a frequent symptom of the chronic form. Attacks of acute enteritis last from two to ten days. The chronic form frequently lasts for years, the patient generally dying of exhaustion.

What is the treatment of catarrhal enteritis?

In the mild acute cases rest, milk diet, and warm applications to the abdomen are all that are necessary. If the attack has been caused by irritants, such as indigestible food or irritant poison, a cathartic given early in the disease is advisable. This should be followed by the use internally of astringents, such as acetate of lead, tannic acid, tincture catechu, etc. For pain and increased peristalsis small doses of opium internally are best. In cases of excessive colic hot poultices to the abdomen and morphine hypodermically are advisable. Should the disease be mainly situated in the large intestine or rectum the frequent use of large enemas, 2 to 3 pints of a solution containing vegetable astringents or disinfectants, gives much comfort. For the tenesmus, suppositories of opium combined with belladonna or hyoscyamus have a beneficial effect. In chronic cases the diet should be carefully regulated, and consist of the most easily digested food. Internally the astringent tonics should be administered, and externally electricity and massage should be used. Where practicable it is well to send the patient for a course of treatment at one of the mineral baths.

CHOLERA MORBUS.

What is cholera morbus?

A disease occurring generally in the summer season, frequently epidemic, and chiefly characterized by an intense, acute catarrhal inflammation of the mucous membrane of the stomach and intestines.

What is its etiology?

It is chiefly a disease of infancy and childhood, especially among those

artificially fed, but is also met with in young adults. The disease is probably produced by a specific micro-organism, but the ingestion of unripe fruit or indigestible food seems to act as an exciting cause.

What is its pathology?

The mucous membrane of the intestines and stomach is swollen and of a dark-red color, but these changes do not correspond to the severity of the symptoms. Venous congestion of the pia mater is also often found.

What are the symptoms?

The attack begins suddenly with pain in the abdomen, excessive vomiting, and diarrhœa, the discharges frequently being almost liquid ("rice-water") in appearance. There are cramps in the muscles, and, though the skin may feel cool and moist, the temperature of the body is high. There is restlessness, often delirium, in children. The pulse is small, weak, and quick, and the face pale. In fatal cases death is preceded by coma. Convalescence in children is very slow.

What is the treatment?

At the beginning of the attack a good dose of calomel may be given; afterward opium for the relief of pain and to check the diarrhœa, and a milk diet. In cases where collapse occurs, hot baths and alcoholic stimulants, either by the mouth, rectum, or hypodermically, will be necessary. Counter-irritation in the form of mustard plasters or electricity often relieves the cramps in the extremities. When convalescence is established a change of air is very beneficial, and often prevents a recurrence of the trouble.

TYPHLITIS AND PERITYPHLITIS.

What are typhlitis and perityphlitis?

Typhlitis is an inflammation of the cæcum which may produce ulceration of the mucous membrane, or extend through the thickness of the entire wall and cause inflammation of the surrounding tissues. Perityphlitis is an inflammation of the connective tissue surrounding the cæcum and the vermiform appendix.

What is its etiology?

In a few cases cold and wet seem to be the exciting cause. In other cases traumatism gives rise to the disease. More frequently inflammation within or around the cæcum arises from irritation caused by accumulated fæces, especially when lodged in the appendix and containing seeds, small pieces of shell, or other hard bodies. The retained fæces sooner or later produce inflammation, ulceration, and sloughing. Occasionally perforation occurs, causing perityphlitis or a general peritonitis.

Perityphlitis also may develop as a secondary inflammation in acute diseases—rheumatism, typhus, etc.

What is the pathology?

The mucous membrane of the cæcum is at first swollen and dark-red in color, but is soon destroyed by sloughing. An ulcer is formed which may heal and cicatrize, or may extend and perforate the cæcum or appendix, causing a perityphlitic abscess. This abscess may break under the colon, peritoneum, or descend down to the thigh and point there.

What are the symptoms?

It may begin slowly with constipation, a dull pain in the right iliac fossa, and repeated attacks of intestinal catarrh, or it may begin suddenly. The patient complains of sharp pain in the region of the cæcum; there may be vomiting, mucoid or bloody passages from the bowels, loss of appetite, accelerated pulse, and fever. The pains extend over the right lower portion of the abdomen, and are increased on even moderate pressure. On examination we find the abdomen slightly swollen and tympanitic, and there is a prominence as of a sausage-shaped tumor in the region of the cæcum. This is due to an accumulation of fæces and inflammation of the cæcal wall. In some cases the process stops at this stage. Large masses of foul-smelling fæces are evacuated, and in a few days the patient is on the way to recovery. Usually, unless active measures are employed, the inflammation spreads, takes on a purulent character, and the peritoneum becomes involved. Then tenderness and swelling are more general, the right leg is kept bent to relieve tension, and later all the symptoms of collapse appear.

In perityphlitis similar symptoms are present, though the tumor is less clearly felt. Should the formation of an abscess take place, there is often fever of a septic type, with signs of fluctuation at the affected spot. The abscess may break externally or into the colon, in which cases recovery often occurs. Should it break into the peritoneum, general peritonitis takes place, generally ending in death.

What are the diagnosis and prognosis?

It must be diagnosed from rapidly-growing new growths of the kidney and ovary, and from abscess due to caries of the vertebræ or neighboring bones. A favorable termination is common, but if abscess forms the result will depend on its early recognition and suitable treatment.

What is the treatment?

At first an attempt to remove the fæcal masses by means of strong cathartics or large high enemata may be made. An attempt should also be made to limit the inflammation by means of opiates internally and the application of ice or the cold coil to the affected part. Should suppuration take place, interference by surgical means should be immediately resorted to.

PERFORATING DUODENAL ULCER.

What is its etiology?

It is generally due to the same causes as ulcer of the stomach. It sometimes follows extensive burns of the skin. It is more common in males than females.

What is its pathology?

It is usually found in the upper horizontal part of the duodenum. The ulcer starts as a local necrosis, followed by a disintegration of necrosed tissue through the action of the gastric juice. Contraction of a resulting cicatrix may cause constriction of the gut. In appearance it resembles the round gastric ulcer.

What are the symptoms?

Sometimes there are no premonitory *symptoms* until perforation takes place or a blood-vessel gets eroded and causes hemorrhage. In other cases precursory symptoms consist of gastric fulness after eating and tenderness on pressure over the situation of the duodenum. The general health often remains good. In cases of perforation an acute peritonitis is set up. These symptoms may persist a variable length of time.

What is its treatment?

It is well to keep the patient quiet and put him on a milk diet, and give large quantities of alkaline waters and bismuth. Narcotics may be used for the relief of pain.

TUBERCULAR ENTERITIS.

What is tubercular enteritis?

An affection of the intestines, generally secondary, and characterized by a caseous degeneration of the intestinal follicles and lymph-glands, followed by ulceration.

What are the etiology and pathology?

It usually develops in long-standing cases of pulmonary tuberculosis from the swallowing of the sputum. Primary cases originate from infected food. The tubercular process begins mostly in the ileum, affecting the lymph-glands and follicles. The glands are swollen and hard, but later they become yellow and soft, breaking down and causing tubercular ulcers. These ulcers vary in size and spread in the circumference of the intestine. The ulcer may cicatrize or break through the intestinal wall, causing peritonitis. On microscopical examination the affected portion of the gland is seen to be filled with round tubercle-cells crowded together, and colonies of bacilli are found in the edges of the ulcers.

What are the symptoms and treatment?

In the secondary form the *symptoms* are not pronounced, excepting

diarrhœa accompanied or preceded by pain. In the primary form, especially in children, there is general emaciation, development is retarded, diarrhœa comes on in attacks. The abdomen is prominent, and the enlarged mesenteric glands can (sometimes) be felt. The pulse is accelerated, and generally small. There is slight elevation of temperature, except at night, when fever may be marked and night-sweats are frequent.

Treatment.—A great deal of out-door life, a generous and easily-digested diet, and change of surroundings are beneficial. Astringents and opiates may be given for the relief of the diarrhœa and pain, though the diarrhœa is, as a rule, uncontrollable. Internally the use of antiseptics is sometimes followed by improvement.

CANCER OF THE INTESTINE.

What are its etiology and pathology?

It is usually primary, and does not occur so frequently as cancer of the stomach. It is most frequently found in the rectum, and is a disease of middle-aged or old people. It occurs very frequently in the colon. All three forms of cancer may be met with in the intestines. The new growth usually surrounds the intestinal tube, and occasionally it breaks down, causing cancerous ulcers. These ulcers may perforate into the peritoneum and surrounding organs.

What are the symptoms and treatment?

The *symptoms*, as a rule, are very obscure. Defecation becomes painful, and constipation is present, which becomes more and more marked. The abdomen becomes prominent, and marked cachexia is developed; emaciation is rapid; the patient finally succumbs to the disease. When situated in the rectum the signs are more distinct. The hard cancerous nodules can be felt; the sphincter ani, when involved, becomes paralyzed; and there is a constant discharge of mucus and blood, and, if ulceration is present, of pus. When the growth causes constriction of the intestine, the fæces are passed in small round lumps or in the form of ribbons. The cancer, if ulcerating, may perforate into any of the neighboring organs. The affection may run a very slow course, but is always fatal. A few cases are benefited by operative interference. Opiates will have to be given for the relief of pain. The constipation may be partially removed by attention to diet, the use of saline laxatives internally, and enemata of hot water administered through a soft-rubber rectal tube. Where the growth is situated low down the judicious use of a whalebone bougie is often of benefit.

CHRONIC CONSTIPATION.

What is understood by the term chronic constipation?

An impairment of the peristalsis of the intestines, characterized by

irregular and infrequent discharge of fæces. It is a complication especially of wasting diseases, and is also brought on from lack of exercise and small amount of food taken. It also occurs in the course of chronic peritonitis and diseases of the brain and spinal cord, causing inhibition of the intestinal nerves. Rarely the affection appears without any apparent systemic cause, and in these cases there are hypochondriasis and other nervous disturbances. Cases are generally difficult to treat, as patients rarely persistently follow a physician's advice. Small amounts of food should be given, frequently repeated, or large quantities when mechanical irritation is required: strong purgatives are contraindicated, as the habit requiring their use is easily developed. Mild laxatives may be employed with care. If the cause of the condition can be ascertained, this of course would require the needed remedies. Strychnine, belladonna, cascara in required dosage often prove effective. Externally the use of massage and faradization of the abdomen, when systematically employed, frequently effect a cure.

INTESTINAL PARASITES.

TAPE-WORMS.

These worms are found in the intestines in three varieties: first, the long or chain tape-worm (*Tænia solium*); second, the broad tape-worm (*Bothriocephalus latus*); third, the (*Tænia mediocanellata*), which is thicker than the *Tænia solium*.

What is the etiology of tape-worm?

The *Tænia solium*, when mature, is from ten to twenty feet long, and of a yellow-white color. The joints near the head are round, and then flatten as they form the body. The head is round, $\frac{1}{32}$ of an inch in diameter, surrounded by four cup-like round suckers. The neck is slender, $\frac{1}{2}$ an inch to 1 inch in length, to which is attached the body, consisting of hundreds of joints or links. The links nearest the neck are very small, but gradually increase in size, and are nearly quadrilateral in shape. The mature links have, in the male, a slight projecting penis in the side, while in the female a uterus with branches along the middle of the link is found. The ovary contains the egg, in which is lodged the embryo with its six hooklets. The blood-vessels run along the side of the joint. This worm is chiefly found in the small intestine, where the head clings to the mucous membrane. The mature links are often cast off with the fæces, and, being deposited on herbage, etc., are eaten by animals, and thus re-enter the stomach.

The *Tænia mediocanellata* resembles the *T. solium*, but its links are broader and thicker. The head has four suckers, but no beak nor hooks. The uterus is much more branched than that of the *Tænia solium*. The undivided segments often move after being passed with the fæces. It is found chiefly in Germany, and is due to eating raw beef.

The *Bothriocephalus latus* has no suckers nor beak on the head, but

only two slit-like openings. It is ten to twenty-five feet long, and has thousands of joints, which are broader than they are long. The neck is very thin and slender. The uterus has many branches, and the sexual opening is in the middle of the abdomen. The eggs are oval and the embryo ciliated. It develops in fresh water, where it is eaten by fish and subsequently by man. It is found in certain European countries only.

What are the symptoms of tape-worm?

Often there are no symptoms at all, except the occasional presence of tænia-links in the stools. In some cases there are nausea and vomiting, an increase in the flow of saliva, and paroxysms of sharp abdominal pain, loss of appetite or abnormal hunger, diarrhœa alternating with constipation. Hypochondriasis and progressive emaciation gradually develop. In children and young adults reflex symptoms are often caused, such as tickling of the nose, dilatation of the pupils, choreic movements, and frequently eczema.

What is the treatment?

Treatment is directed to killing or benumbing the head of the worm and causing its expulsion. Patients should be given a mild laxative, and then made to fast for twelve hours: one of the anthelmintics may be then given, of which one of the best is filix mas, to be followed after twelve hours more of fasting by a large dose of calomel or one of the saline cathartics. During the treatment all movements should be carefully inspected for the head of the worm. After-treatment will consist of tonics and a generous diet.

ROUND-WORMS (ASCARIS LUMBRICOIDES).

What is the history of round-worms?

The ascaris is cylindrical in shape, from six to twelve inches in length, pointed at both ends, and of a pink color. The sexes appear in different individuals. The head has three lips set with teeth. There is a long tail, straight in females and curved in males. The females have large ovaries containing millions of eggs, the males having long seminal tubes, with a small penis at the end of the tail. These worms are found mostly in the small intestine, and are often very numerous. In vomiting they may be brought up with vomited matter, and they sometimes enter the bile-ducts and peritoneum. The disease is seen most frequently in children.

What are the symptoms and treatment?

As a general rule, the presence of these worms gives rise to no symptoms. Occasionally abdominal pain and reflex symptoms, like itching of the nose or even slight spasms, are caused by their presence. When present in great numbers they may simulate an intestinal obstruction.

They occasionally enter the bile-ducts, causing the symptoms of catarrhal jaundice, and in rare cases the formation of abscess. Doses of santonin, gr. j–iv, combined with calomel, are the remedy most frequently employed.

OXYURIS VERMICULARIS (PIN-WORM).

What is the history of pin-worm?

The oxyuris is a small, thin, round worm, the females being more numerous and larger than the males. We find them mostly in the lower portion of the intestines, chiefly the rectum, where they sometimes cover the whole mucous membrane like a thick coating. The eggs are laid in the rectum, and, amongst those of uncleanly habits, may be transmitted from the fingers of one man to another. The female sexual apparatus is near the head, the male penis near the tail end.

What are the symptoms and treatment?

When high up in the intestines there are no *symptoms*. When in the rectum they cause a constant itching and burning, especially in the evening and during the night. There is a constant desire of defecation, the stools having a great deal of mucus from irritation of the rectum, and containing numbers of pin-worms moving about. The worms often crawl from the anus into the vagina of children, setting up irritation and leading often to rubbing of the parts and masturbation. Internally, santonin, followed by cold enemata, is often sufficient to dislodge the worms. In obstinate cases a plain enema, followed by one containing a good quantity of tannic acid, often effects a cure. The general health rarely requires special attention.

ANCHYLOSTOMUM DUODENALE.

What is the history?

This worm was first noticed among the inhabitants of Italy and Egypt. It is small, the female being larger than the male. The head has a cup-like mouth provided with six teeth, and the animal lives in the manner of the leech, by withdrawing the blood from the mucous membrane of the intestine. When present in large numbers profound anæmia is produced. The eggs develop in water, and the drinking of impure water or its introduction into the system is a cause of the trouble.

What are the symptoms and treatment?

We have to deal with a gradual progressive general anæmia, without symptoms of systemic affection. The anæmia may finally end in death if the disease is not recognized in time. The fæces should be examined in all suspected cases.

For *treatment* we may use the ordinary anthelmintics.

TRICHOCEPHALUS DISPAR (WHIP-WORM).

What is the history?

It is one to two inches long, the male being the longer, with a spiral tail. The female is straight, with the lower part studded with eggs. It is found mostly in the cæcum, and hardly ever gives rise to any symptoms.

Diseases of the Peritoneum.

ACUTE GENERAL PERITONITIS.

What are its causes?

It most frequently occurs as secondary to some other inflammation of the abdominal viscera or to traumatism. The involvement of the peritoneum occurs from extension of the inflammation in the puerperal state or from rupture of the gall-bladder or of the hepatic ducts, or from the rupture into the peritoneal cavity of hepatic, ovarian, or other abcesses. It also sometimes occurs in the course of Bright's disease or from exposure to cold.

What is the pathology?

The peritoneum is at first reddened. and its surface is soon covered with a layer of fibrin, or fibrin and pus containing large numbers of leucocytes. The cavity of the peritoneum contains more or less seropurulent fluid, and there are adhesions between its opposing surfaces. The intestines are always much distended by gas.

What are the symptoms?

The disease may come on gradually, when there is abdominal pain and soreness, followed by the general *symptoms.* When the disease comes on suddenly, it is ushered in by a chill. and there is marked pain of a burning or lancinating character over the abdomen. Acute pain is produced by deep inspiration, and the respirations are usually shortened, but increased in frequency. Movements of the body or acts of coughing and sneezing cause intense pain. The abdomen is tense, tympanitic, and very tender on pressure. The patient lies on his back with the legs flexed. Vomiting generally exists, sometimes of a stercoraceous nature. The bowels are generally constipated. The temperature is markedly raised, and the pulse is small, wiry, and much accelerated. The face generally has a characteristic drawn appearance; the intellect remains clear. Retention of urine exists in some cases.

What is its treatment?

Treatment consists of rest in bed, cold externally to the abdomen, and the use internally of repeated small doses of calomel or sulphate of magnesia and small doses of opium. The diet should be liquid, and consist

of concentrated food, given frequently and in small quantity. The use of alcoholic stimulants may be necessary. Where opium is used the amount given in each dose should be regulated by the effect of the previous dose. In fatal cases the disease generally lasts from five to six days.

ACUTE AND CHRONIC LOCAL PERITONITIS.

What is its causation?

It is caused by extension to the peritoneal surface of inflammation of an organ, as in ulcer of the stomach, the intestines, liver, gall-bladder, spleen, urinary bladder, and the uterus and its appendages. It also occurs as a complication of the inflammation caused by neoplasms in the abdominal organs. It frequently runs a chronic course.

What is its pathology?

The affected portion of the peritoneum is reddened, and the exudation in many cases is chiefly fibrinous. There are often adhesions, and in the acute form encapsulated collections of pus. In chronic cases contraction of the adhesions often gives rise to displacement of some of the viscera.

What are the symptoms?

The *symptoms* are those of a general peritonitis localized, and where the disease exists over the spleen, stomach, or liver a friction sound can sometimes be made out by auscultation. When it occurs in the neighborhood of the uterus the patient is very subject to recurrent attacks.

What is the treatment?

Treatment is that of the general form. In all cases of peritonitis antiseptics should be rigidly adhered to.

CHRONIC GENERAL PERITONITIS.

What is the etiology?

It often follows an attack of acute peritonitis. In other cases the chronic inflammation, attended by thickening of the peritoneum, is a result of chronic inflammation of some of the abdominal viscera, attended by serous effusion into the peritoneal cavity. Occasionally it results as an extension of chronic inflammation of the coating of the stomach.

What is the pathology?

The peritoneum is thickened, and the adjacent surfaces are often joined together by threads of new-formed connective tissue. The abdominal cavity contains more or less fluid, which may be serous, sero-fibrinous, or sero-purulent in character.

What are the symptoms?

Where the disease follows the acute form the local abdominal symptoms become less, but do not wholly disappear. Disturbances of digestion still persist, and there is generally occasional vomiting. The action of the bowels is irregular. As the disease progresses the patient loses weight and shows the other symptoms of anæmia. On physical examination the abdomen is found to be distended, and, the patient being placed on his back, the percussion note in the region of the umbilicus is tympanitic and in the lumbar region dull. On percussion over the lumbar region an impulse is felt in the corresponding part of the opposite side. The disease is attended with slight elevation of temperature above the normal, but the pulse is often small and accelerated.

What is the treatment?

Treatment will consist of regulation of the functions of the liver and intestines. Should ascites be marked, aspiration might become necessary. Treatment can only be palliative, as the patient finally dies with exhaustion. Treatment directed to the primary cause should always be employed.

TUBERCULAR PERITONITIS.

What are its etiology and pathology?

It is caused by a localized tubercular inflammation of the peritoneum. This tubercle tissue may be disseminated in the form of miliary tubercles, scattered nodules, or flat plaques on the surface of the peritoneum. There is generally a large quantity of serum in the abdominal cavity. The disease is frequently secondary to tubercular inflammations in other organs of the retro-peritoneal glands. Occasionally it seems to be a primary affection.

What are the symptoms?

The *symptoms* are those of chronic peritonitis, which shows a progressive course. The abdomen is much distended; its walls are resistant to pressure, and apparently much thickened; and a large amount of fluid, as determined by percussion, is often present in the abdominal cavity. On aspiration the effused fluid is frequently found to be more or less hemorrhagic in character.

What is the treatment?

General treatment is that of pulmonary tuberculosis, but the opening of the peritoneal cavity and its thorough washing out are sometimes followed by temporary improvement. The disease is fatal.

CARCINOMA OF THE PERITONEUM.

What are its etiology and pathology?

It is generally secondary to cancerous growths in other parts. It occurs in the form of colloid cancer or of hard nodules, which are com-

posed of connective-tissue stroma, enclosing cavities containing epithelial cells. There may be many small tumors or one large mass. The peritoneum is generally thickened; there is also thickening of the omentum, and the intestines are matted together by adhesions. The disease occurs in persons over forty years of age.

What are the symptoms and treatment?

The *symptoms* are those of a slowly increasing chronic peritonitis. There are disturbances of the digestive functions, progressive loss of flesh and strength, and the development of a marked cachexia. Where the tumor is single it is often to be observed on palpation and percussion. In the early stages of the disease *treatment* by operative interference may be of benefit. Other treatment will be symptomatic. The disease is fatal.

HYDROPERITONEUM.

Syn.—Ascites.

What is its causation?

It occurs as a symptom of other diseases. It may be a local transudation into the peritoneal cavity or a symptom of general dropsy. It occurs with chronic inflammations of the peritoneum or as a result of pylephlebitis (of the portal vein). It also occurs in cases of interstitial or syphilitic hepatitis, and in cases of abscess, cancer, or other tumors of the liver. In conjunction with general dropsy it occurs in Bright's disease, in compensating valvular lesions of the heart, in chronic induration, and in other chronic diseases causing an hydræmic condition of the blood.

What is its pathology?

The fluid generally consists of yellowish serum. When caused by new growths it is often darker in color, caused by staining with blood. The specific gravity is from 1004 to 1020. The fluid generally contains about 2 per cent. of albumin. On the removal of fluid from the body it is found to contain fibrinogen, and often coagulates spontaneously. Rarely the fluid is of a milky color from pressure or rupture at the large chyle-vessels. This is also true in a few cases of cancer or tubercle of the peritoneum.

What are the symptoms?

Effusion generally takes place without pain, tenderness, or local subjective *symptoms*. Enlargement of the abdomen is first noticed, and increases rapidly. Then there are symptoms caused by pressure of fluid on the abdominal organs. There is often œdema in the lower extremities, and the functions of the abdominal organs are impaired by compression. There may be more or less dyspnœa from the forcing upward of the diaphragm. The superficial abdominal veins are abnormally

prominent, and where the ascites is caused by diseases of the liver jaundice is often marked. The urine is scanty, and high in color. Fever is absent, but the pulse is accelerated and generally feeble.

What is its diagnosis?

Physical examination shows the distension (with patient on back) to be symmetrical. The line of tympanitic resonance will differ with the position of patient. When opposite sides of the abdomen are percussed, below the level of the fluid the wave of fluctuation is felt. The withdrawal of a small portion of the fluid by means of the hypodermic syringe, and its examination, will often settle the diagnosis. This condition may be mistaken for enlarged bladder, pregnancy, or cystic tumors of the abdominal organs.

What is the treatment?

Treatment will be directed to the primary cause and removal of the fluid. For the latter purpose the administration of hydragogue cathartics and the salines and vegetable diuretics is indicated. Should the distension be sufficient to cause great distress or signs of heart failure, aspiration or tapping must be resorted to.

Diseases of the Liver.

CATARRHAL JAUNDICE.

What is catarrhal jaundice?

A catarrhal inflammation of the biliary ducts, preventing the flow of bile into the intestines and causing a yellow discoloration of the tissues and fluids of the body, due to absorption of biliary pigment by the blood and its deposition in the various tissues.

What are its etiology and pathology?

Causes producing gastro-duodenal catarrh may also induce inflammation of the mucous membrane of the bile-ducts. It is also caused by irritants of a chemical or mechanical nature; by congestion of other abdominal organs, especially hyperæmia of the liver, as in cancer; and by an infection whose character is undecided at present. The common duct contains mucus; its mucous membrane is reddened and swollen, and its lumen is narrowed or completely occluded. Above the occlusion there is dilatation of the duct and its branches, often extending into the liver.

What are the symptoms?

The disease is usually preceded by malaise, anorexia, nausea, slight vomiting, and other *symptoms* of gastro-intestinal catarrh. As soon as obstruction occurs, there are signs of reabsorption of bile into the lymphatics, and thence into the blood. The conjunctivæ become yellow, and

soon the skin and the mucous membranes become similarly stained. There is itching of the skin, often attended by urticaria. The heart's action is abnormally slow and full. Occasionally hemorrhages into the skin take place. There are general languor, pain in the muscles, and a feeling of weakness. The stools of the patient have a white clay color, from absence of bile. Owing to the same cause the food decomposes rapidly in the intestines and the stools have an offensive odor. Constipation is present, due to a lack of peristaltic action. Owing to the impairment of digestion, proper absorption is prevented and emaciation ensues. The urine is dark in color from the presence of biliary pigments, as is shown by the chemical reactions. Sometimes albumin and hyaline casts are found in the urine. The temperature may be subnormal. On physical examination the area of splenic and liver dulness is found increased. The hepatic area is tender to pressure, and a tumor projecting below the ribs can often be felt, which is due to a distended gall-bladder. All these symptoms may last one to three weeks, and gradually disappear, but occasionally they become chronic.

What is the treatment?

In mild cases rest and light food, with the exclusion of fats, are sufficient. In pronounced cases the alkaline carbonates or phosphate of soda, in moderate doses frequently repeated, should be given internally; saline carthartics should be used for the constipation. Massage and faradization of the gall-bladder have been lately used. Large cold-water enemata are also advocated.

BILIARY CALCULI.

What are biliary calculi?

Concretions of small or large size found in the bile-ducts or gall-bladder.

What is their etiology?

The origin of bile-stones has not been definitely determined. The principal causes of their formation are retention of bile and consequent inspissation, and also an acid reaction of the bile and a consequent abnormal deposits of lime salts. Calculi are more frequent in women than in men, especially in the aged. The excessive consumption of nitrogenous foods and fat, combined with sedentary habits, gout, obesity, or disease of the liver or ducts, predisposes to the formation of calculi. The stones may be as small as a seed or as large as a hen's egg, assuming the shape of the gall-bladder. There may be a number of small stones filling up the gall-bladder, and they generally produce a mechanical irritation of its mucous membrane. The stones vary in color from white to brown, and often present various strata. When recently formed they are very brittle, but become harder with age. Chemically, they consist of cholesterin and biliary pigment, mixed with lime and magnesium salts. The

centre of the stone is usually the hardest portion, and consists of lime salts and pigment. The very small biliary concretions may also be found in the liver and small ducts. Calculi may be present for a long time without causing structural change in the organ, but the sharp edges of the stones occasionally cause inflammation of the mucous membrane surrounding them, followed by ulceration, and finally perforation of the bladder or duct. Hepatic abscesses may arise from this cause, or partial or complete closure of the ducts with subsequent jaundice.

What are the symptoms?

Occasionally the calculi, whether in the liver or gall-bladder, are propelled into the common duct to be voided into the intestines. The passage of the larger calculi gives rise to marked symptoms. There is a sudden attack of sharp pain of a cutting nature, which follows the line of the common duct and may radiate over the rest of the abdomen and toward the right shoulder. This pain is not preceded by premonitory symptoms, but often follows a hearty dinner. The pain is paroxysmal; the abdominal muscles are tense; the pulse is small, quick, and hard; the skin cold; there are nausea and vomiting, and rarely severe chill or even convulsions. The attacks may last from a few hours to a few days. The pain gradually subsides as the calculi slip into the intestine. These attacks are sometimes followed by jaundice. The attacks may not come on for years or may be frequently repeated. Should a calculus become permanently lodged in the ducts, the sharp pain lasts for several days, and is followed by a dull, constant pain, while the occlusion may give rise to jaundice or dropsy of the gall-bladder. If a calculus causes ulceration, we have symptoms analogous to ulceration of the vermiform appendix. In these cases at first there may be no symptoms, but when the peritoneum becomes affected there are symptoms of local peritonitis, and should there be perforation of the wall of the duct, these are followed by symptoms of general peritonitis, caused by the escape of bile or calculi into the abdominal cavity. Rarely perforation takes place externally or into the duodenum. Intestinal obstruction may be caused by the impaction of large calculi in the intestines.

What is the diagnosis?

This affection must be differentiated from intestinal colic, renal colic, cardialgia, and neuralgia of the abdominal nerves. The *diagnosis* will be based chiefly on the nature of the onset and character of the pain, on the presence of gall-stones in the stools, and on jaundice. Most cases end favorably in complete or partial recovery.

What is the treatment?

During the colic the inhalation of chloroform (*pro re nata*) and the use of large doses of opium internally are of greatest use. A hot bath or hot poultices over the liver are often of benefit. For the severe vomiting, ice, the bromides, or opium may be used. Where collapse occurs stimulants in large doses are necessary. After the colic has passed mild

laxatives for the removal of the calculus may be given. To prevent the new formation of calculi, alkaline mineral waters, phosphate of soda, chloroform, and turpentine internally have all been used, as solvent powers have been claimed for them. Should the calculus become impacted in the ducts or intestine, surgical interference may be necessary.

ABSCESS OF THE LIVER (SUPPURATIVE HEPATITIS).

What is suppurative hepatitis?

A suppurative inflammation in the liver, with subsequent disintegration of the liver-cells and the formation of one or more abcesses.

What is its etiology?

It is caused by the entrance of bacteria into the liver by way of the bile-duct after inflammation of the duct of a suppurative character, or by way of the vena cava. The bacteria may be carried by means of the circulation from the focus of inflammation in distant parts of the system. Direct exciting causes are wounds of the liver, ulceration or gangrene of the abdominal organs, or inflammation and thrombosis of the veins. The disease is primary in tropical countries.

What is the pathology?

The blood-vessels surrounding the infected spot are filled with microbes. The new cells and the cells of the parenchyma are seen to be disintegrating and softening, and thus an abscess is formed. This abscess sometimes extends in every direction, and may open into the surrounding organs or externally. If the abscess is quite small, its contents may be absorbed. In cases of recovery a dense cicatrix is found at the site of the abscess.

What are the symptoms?

As hepatic abscess is a complication of many diseases, the *symptoms* are often indistinct. In pyæmia there may be numbers of very small abscesses without giving rise to any symptoms. In typical cases of abscess there are tenderness on pressure and a dull pain in the right hypochondrium, due to tension on the capsule of the liver or to a complicating perihepatitis. Pain in the right shoulder is also present. On examination the area of hepatic dulness is found to be enlarged, and if the abscess is very large we may even get a sensation of fluctuation. Jaundice occurs in some cases. Elevation of temperature is a constant symptom, except where there is a chronic encapsulated abscess. Many cases begin with a chill, followed by high temperature and subsequent sweating; and these symptoms frequently occur at varying intervals. Anorexia is marked; there is a progressive loss of flesh.

What is its prognosis?

When occurring in pyæmia the disease is always fatal. If due to calculi, the abscess may disappear after passage of the calculi. Occasion-

ally perforation takes place into the neighboring cavities, setting up a suppurative inflammation, as general peritonitis, empyema, or purulent pericarditis. Should perforation into the stomach occur, vomiting of pus takes place. Where perforation in the intestine occurs, the movements will contain a large amount of pus. Almost all cases terminate fatally.

What is the treatment?

Cold compresses externally and the use of calomel or emetics internally are recommended. The use of quinine and stimulants is called for to relieve the chills and fever. Operative interference is advisable as soon as the diagnosis is established. If the careful introduction of a fine aspirating needle shows the presence of pus, operative measures will be indicated.

CIRRHOSIS OF THE LIVER.

Syn.—Interstitial hepatitis.

What is cirrhosis of the liver?

A chronic inflammation of the fibrous covering and interstitial tissue of the liver, which results in the production of new connective-tissue elements and atrophy of the parenchyma.

What are its etiology and pathology?

The most frequent *cause* is the excessive use of alcohol, causing impairment of the nutrition of hepatic cells and their consequent disintegration. It also occurs from obscure causes, as a result of infectious diseases and syphilis. It is more common in men than in women. In the first stage the liver is increased in size, the surface is smooth, and the capsule slightly thickened. The interstitial connective-tissue elements are much increased. In the second stage the liver becomes pale and hard, and is diminished in size from the shrinking of the new connective tissue. Its surface is often irregular and covered with nodules, due to the gradual changing of new connective tissue into the cicatricial form. The border of the liver becoming thin and indurated, its substance is hardened and dark.

What are the symptoms?

The first *symptoms* are those of congestion of the liver, often preceded by symptoms of gastric disturbance, as a sense of fulness in the epigastrium, eructations of gas, nausea, and vomiting. Marked symptoms develop when the portal system becomes interfered with from the contraction of new connective tissue. Ascites, more or less marked, is found, and the area of splenic dulness is enlarged. Symptoms of chronic gastric and intestinal catarrh begin, frequently accompanied by hemorrhage from the stomach and intestines and the formation of hemorrhoids. Jaundice, though not a constant symptom, is often present. The area of hepatic dulness is decreased, and the nodules on the surface of the

organ may sometimes be felt. Emaciation is progressive. The existing ascites is often complicated by œdema of the lower extremities. Fever is absent and the pulse is small. The frequency of respiration is increased from compression of the lungs and diaphragmatic interference, due to ascites. The urine is dark in color and contains an excessive amount of urates; the specific gravity is high. In cases of long standing there is often marked enlargement of the abdominal veins, due to interference with the portal circulation. The disease is chronic and may last for years, usually ending fatally. Death may be caused from exhaustion, due to disease itself or to hypertrophy of the heart or chronic inflammation of the kidneys or meninges. Hepatic syphilis, chronic obstruction of the portal circulation, due to calculi, etc., or chronic tubercular peritonitis, may be mistaken for this disease.

What is its treatment?

The diet should be limited, easily assimilated, and all alcoholic stimulants forbidden. Saline purgatives may be used to relieve the congestion. The internal administration of iodide of potash in large doses is sometimes followed by good results. Where there is marked distress from ascites, paracentesis must be resorted to.

ACUTE YELLOW ATROPHY OF THE LIVER.

What is acute yellow atrophy of the liver?

An acute fatty degeneration of the liver which may be primary or secondary, attended with a yellow discoloration of the organ.

What are the etiology and pathology?

It is most frequently seen in women, especially during pregnancy, but occurs with typhoid fever, puerperal fever, septicæmia, and phosphorus-poisoning. In the primary form the patient is attacked suddenly, and the disease rapidly ends in death. As it is sometimes endemic, some authors have considered it infectious. The liver is diminished in size, the capsule is contracted, and the organ is soft. The surface is yellow and the interior red and yellow. On microscopic examination the hepatic cells are found fatty, degenerated, and many of them have disappeared, leaving blood-vessels and connective tissue. The blood-vessels are found enlarged and congested, giving the mottled red appearance. In many cases the spleen is enlarged and affected with fatty degeneration, and the same change is found in other organs. Ecchymoses into the skin and mucous membranes are often present. Examination of the blood frequently shows the presence of leucin and tyrosin.

What are the symptoms?

The attack may come on suddenly or there may be prodromata. Prodromic symptoms are—loss of appetite, fulness in the epigastrium, headache, nausea, vomiting, and slight jaundice. At the onset of the disease there are headache, insomnia, and often delirium and convulsions of

an epileptic nature. This stage is followed by stupor, coma, and death. The jaundice is very marked, and the urine of a deep color, caused by the presence of the bile acids. Fever is very high. The pulse is frequent and the tongue dry. The fæces and the urine are passed involuntarily. There may be bloody vomiting and bloody stools. The urine often contains leucin and tyrosin crystals, and the amount of urea is greatly diminished. On physical examination the area of hepatic dulness is much diminished in size, and there is tenderness on percussion over the right hypochondrium. The area of splenic dulness is greatly increased. The duration of the disease is from a few days to a few weeks.

What is the treatment?

Treatment is entirely symptomatic.

PERNICIOUS JAUNDICE.

What is pernicious jaundice?

A chronic obstruction of the bile-ducts, followed by sudden development of acute nervous symptoms and ending in death.

What are the etiology and symptomatology?

When chronic retention of bile occurs in any affection of the liver, there is a sudden development of symptoms resembling those of acute yellow atrophy. These consist of delirium, convulsions, high fever, subcutaneous and submucous hemorrhages, and coma. Some claim the infection to be due to the retention of bile in the blood. Others, that it is produced by the presence of bile-producing elements in the blood, acting like an acute poison. Still other authorities think that from absence of proper assimilation cerebral anæmia develops, producing the above group of symptoms. It is invariably fatal, and *treatment* consists in quieting the delirium.

CANCER OF LIVER AND BILE-DUCTS.

What are its etiology and pathology?

It is rarely primary, but is often secondary to cancer of the intestinal organs. The cancerous growths are usually scattered over the liver, and are varying in size. In extensive carcinomata the liver becomes very much enlarged. The nodules may be firm or soft, or white or reddish in color, and have a depression in the centre. Rarely the infiltration appears to be diffuse instead of nodular. The primary form is more common than cancer of the bile-duct or gall-bladder. The disease occurs between the ages of forty and sixty, and heredity appears to have a causative relation to it.

What are the symptoms?

If the portal veins or bile-ducts are not compressed, the symptoms are

very indistinct: there are pain in the hypochondrium, radiating to the shoulder, a feeling of pressure in this region, and on examination an irregular enlargement of the liver, giving flat resonance on percussion, is found. Where the carcinomatous cachexia is developed and the abdominal fat is wanting, the enlarged nodules may often be seen or felt on forcing the liver down by deep inspiration. Ascites and jaundice gradually come on as a result of the compression, and symptoms of gastric and intestinal catarrh develop. The urine is sometimes scanty and is dark in color.

The *diagnosis* of cancer from benign tumors, echinococci, or abscess of the liver is often difficult. The disease, as a rule, lasts a few months and ends in death.

What is the treatment?

It consists in the relief of pain and the administration of artificially digested foods.

ECHINOCOCCUS OF THE LIVER.

What is echinococcus?

A small tape-worm, the young brood of a mature worm. It has three or four joints, and develops from ingestion of eggs which occur in drinking-water containing the excrement of animals affected with tænia. The shells of the eggs are dissolved in the stomach, the embryo is liberated, and, penetrating the stomach, is carried by the blood into different organs. When the embryo is deposited in an organ, a cyst enclosing it is developed, which is surrounded by a capsule of connective tissue. The cyst swells to a large vesicle containing a large colony of immature tæniæ, each having four suckers and six hooklets. These cysts may have daughter cysts, and thus enlarge, sometimes in the organ invaded, to an enormous size; but finally the echinococcus dies, and the contents of the cyst become absorbed or calcified. Occasionally the sac bursts, setting up inflammation in the neighboring parts.

What are the symptoms?

Echinococci may remain in the liver for years without causing symptoms. If large, there is a feeling of pain and oppression in the right hypochondrium, more or less dyspnœa, ascites, or jaundice from compression. The liver is enlarged, firm, and smooth; the spleen is also congested. Emaciation is rapid until death comes on. Occasionally fluctuation at the site of the cyst can be detected. The sac may rupture, and its contents be emptied externally or into the pleural cavity, abdominal cavity, intestines, bile-ducts, or vena cava. When this takes place an acute inflammation is set up. The aspirator is useful for diagnosis in doubtful cases.

What is the treatment?

Iodide of potash and mercury have been used internally, but surgical interference as soon as practicable gives the best results.

CONGESTION OF THE LIVER.

Give the causes and symptoms of congestion of the liver.

Active congestion arises from blows over the region of the liver; from increase of blood-pressure in the portal veins after immoderate eating or drinking; from ingestion of irritating food or infectious matter; and occasionally from the stoppage of bleeding from hemorrhoids or the uterus. Passive congestion may result from cardiac disease or from acute or chronic pulmonary affection. On examination the liver is found more or less enlarged. It is dark on section, and pigmented, and often there are scattered yellow spots, due to fatty infiltration. In many cases the only symptoms are a feeling of fulness in the hepatic region and an increase in the area of normal liver dulness on percussion. In more severe cases there may be jaundice from the compression of the bile-ducts, and the symptoms of gastro-intestinal dyspepsia.

Treatment consists in the regulation of the diet, mild systematic exercise, and the use of saline waters. In most cases the cause of the congestion is apparent, and treatment can be directed to it.

HYPERTROPHY OF THE LIVER.

What is hypertrophy of the liver?

A slow enlargement in the size of the liver which sometimes occurs in the course of chronic malarial fever, diabetes, rachitis, or chronic poisoning by alcohol. The condition rarely gives rise to any marked symptoms.

FATTY LIVER.

What is fatty liver?

An infiltration with fat between and in the liver-cells, causing an increase in the size of the organ. It may occur with general obesity, with cancerous diathesis, rachitis, chronic tuberculosis, and chronic alcoholic poisoning. The condition itself may last for a long time without impairing the function of the organ. *Symptoms* are not marked.

AMYLOID LIVER.

What is amyloid liver?

A waxy degeneration of the organ, usually a symptom of general amyloid affection. It occurs with tuberculosis, syphilis, or long-standing suppuration from any cause. The liver is much enlarged and the liver-cells are atrophied and degenerated. The spleen, kidney, and intestines are

usually the seat of amyloid degeneration at the same time. *Treatment* will be directed to the cure or alleviation of the original disease.

SUPPURATIVE PYLEPHLEBITIS.

What is suppurative pylephlebitis?

A purulent inflammation of the portal vein and its branches.

What are its etiology and pathology?

It is usually secondary to purulent inflammation of the organs, especially perityphlitis, gastric ulcer, hepatic or splenic abscesses, dysentery, and, in the newly born, infection from suppurative inflammation of the umbilicus. The wall of the portal vein is thickened and infiltrated with pus containing large colonies of bacteria. A septic thrombus forms, spreading upward and downward. This breaks down, and particles of it are carried to other organs, forming secondary abscesses.

What are the symptoms and treatment?

In addition to the pyæmic or other symptoms, caused by the original disease, there may be epigastric pain, radiating downward or laterally. As soon as a thrombosis develops symptoms of obstruction appear. The spleen is enlarged, ascites is rapid, and jaundice occurs. When the emboli are carried into the liver, abscesses develop, and if there have been no pyæmic symptoms they now appear. The fever is very high, and chills occurs at frequent intervals, followed by marked perspiration. The pulse is small, hard, and rapid. Delirium and coma soon come on. Vomiting and a diarrhœa of a bloody character are frequently noticed. The urine is diminished in amount. The patient soon dies with all signs of collapse.

The relief of pain by the administration of narcotics and the use of heat externally is all that can be done for *treatment.*

THROMBOSIS OF THE PORTAL VEIN.

What is thrombosis of the portal vein?

A chronic adhesive inflammation of the portal vein and branches, with the production of a thrombus within the vein.

What are the etiology and pathology?

It is usually secondary, and due to compression from cirrhosis, syphilis, and new growths. The thrombus which is formed is at first soft and red, but soon becomes hard and friable. Pieces of it are easily carried off by the circulation, and cause a blocking up of the smaller veins.

What are the symptoms and treatment?

The *symptoms* are those of obstruction, and may develop slowly or rapidly. If the thrombus is large, the spleen is enlarged, ascites develop, and gastro-intestinal irritation, due to secondary venous stasis, is noticed.

The abdominal veins become enlarged, but all symptoms may abate if proper collateral circulation is established. When the disease is of long standing the liver may be somewhat diminished in size. The patient may survive for years or die from some intercurrent affection, like the plugging of a cerebral artery, etc. *Prognosis* is bad, and *treatment* can only be symptomatic.

Affections of the Spleen.

EMBOLISM.

What are the causes, symptoms, and treatment?

It results from emboli being detached from the left side of the heart in endocarditis or aortic aneurisms, and carried into the arteries of the spleen. As many of these arteries are terminal ones, infarctions result. Should the embolus be of a septic nature, abscess occurs. These splenic abscesses often reach a very large size. Non-septic emboli give rise to no marked symptoms, but their results in the form of limited calcification, cheesy degeneration, or cicatricial contraction are sometimes observed after death. Sudden enlargement of the spleen, attended with pain and tenderness in the left hypochondrium and occurring in the course of endocarditis, will give rise to a suspicion of splenic embolism. Should the patient also exhibit pyæmic symptoms, exploration with an aspirating needle will frequently confirm the diagnosis.

The *treatment* of splenic abscess is similar to that of the liver.

ENLARGEMENT OF THE SPLEEN.

What are the causes and symptoms?

Acute enlargement of the spleen occurs in diseases causing obstruction in the portal circulation, and it also occurs frequently in the course of the infectious diseases and yellow atrophy of the liver. Chronic enlargement of the spleen results from repeated malarial attacks or from chronic obstruction of the portal circulation. This is most frequently due to chronic interstitial hepatitis and also chronic valvular cardiac diseases. It also occurs in the course of leucocythæmia, or Hodgkin's disease. Enlargement of the spleen is not attended with much pain or tenderness, but where it is extreme there is a sense of uneasiness, due to the increased weight of the organ. This condition may be ascertained by palpation and percussion.

Treatment is that of the causative trouble.

WAXY DEGENERATION AND TUBERCULOSIS.

What are the causes and symptoms of waxy degeneration?

It exists as a concomitant of waxy degeneration of other organs, and is observed in two forms; the limited (sago spleen) and the diffuse

variety. In the limited form the Malpighian corpuscles, and in the diffuse form the splenic pulp, are affected. The organ is enlarged wholly or in part. Tuberculosis of the spleen exists as a secondary deposit of either miliary granulation or cheesy collections of tuberculous material. The disease is seen in acute miliary tuberculosis of adults and in tuberculous disease affecting children. The organ is more or less enlarged, but other local symptoms are absent.

TUMORS OF THE SPLEEN.

Neoplasms occur secondarily to their occurrence in other organs. Hydatid tumors have been observed, and also gummata. Cancer occurs secondarily to that of the liver or other abdominal organs.

Treatment is the same as where they occur in other organs, except that operative interference has rarely been followed by good results.

Diseases of the Pancreas.

HYPERTROPHY AND ATROPHY.

Hypertrophy is mostly due to enlargement caused by neoplasms within the gland. Atrophy results from diabetes or chronic diseases or from pressure upon the gland by tumors in the neighboring organs.

HYPERÆMIA AND ANÆMIA.

Hyperæmia is caused by increased blood-pressure, due to chronic disease of the heart, lungs, or liver. Anæmia is observed as a result of general anæmia, marasmus, or after great hemorrhage.

ACUTE PRIMARY PANCREATITIS.

What are the causes, pathology, and symptoms?

It is an acute inflammation of the pancreas. The excessive use of tobacco, alcohol, or mercury seems to predispose to it. It is more common in males than in females. The gland is found to be enlarged with hemorrhages scattered over its surface and through it, and the blood-vessels are congested It begins with deep-seated pains of a colicky character over the region of the pancreas. There are restlessness, nausea, vomiting, constipation, and considerable fever. Jaundice is absent. Within a few days the pain becomes intense, the pulse rapid, small, and weak, the extremities cold, and collapse, followed by death, takes place as a rule. In a few cases abscess in the substance of the pancreas has occurred, which, bursting into the peritoneum, sets up a peritonitis.

The *treatment* is symptomatic.

ACUTE SECONDARY PANCREATITIS.

What are the causes, pathology, and symptoms?

It follows infectious diseases, and consists of a parenchymatous inflammation of the organ. The gland is swollen, reddish in color, and filled with granulations. *Diagnosis* between this affection and affections of neighboring organs is difficult. The *symptoms* are those of acute pancreatitis.

CANCER OF THE PANCREAS.

What are the symptoms and treatment?

The disease occurs in the primary form, and is usually situated in the head of the pancreas. The surrounding tissues often become involved. When the new growth is small, *diagnosis* is difficult. As it increases in size a tumor may often be felt in the epigastrium. The patient is usually advanced in years, and begins to lose flesh and strength rapidly. There are dull pain in the epigastrium, nausea, and often the symptoms of intestinal dyspepsia. Should the tumor press upon the bile-duct or portal vein, jaundice or ascites may occur. The stools are frequently light in color, and show the fats to be in an undigested state. The disease lasts from six to twelve months, and is fatal.

Treatment is limited to the alleviation of pain with narcotics and the administration of artificially digested food.

ECCHYMOSES INTO THE PANCREAS.

These generally occur in fat people as a result of chronic congestion, due to venous stasis of surrounding organs. If slight, they give rise to no symptoms. If extensive, they may be fatal, in which case death occurs suddenly.

DISEASES OF THE URINARY ORGANS.

ACUTE CONGESTION OF THE KIDNEYS.

What is acute congestion of the kidney?

A sudden increase beyond the normal in the amount of blood contained in the kidney.

What are its causes?

It is caused by the ingestion of poisons, by injuries or surgical operations, and by vaso-motor paralysis. It also frequently occurs in the course of chronic nephritis or in degeneration of the kidney.

What is its pathology?

The kidneys are enlarged, have a dark-red color, and small hemorrhages beneath the capsule are often found.

What are its symptoms?

Symptoms, referable to the trouble itself, are those of a slight cold, attended by rise of temperature and a feeling of heaviness across the loins. The urine is diminished in quantity, the specific gravity is generally increased; it is high-colored and usually contains blood. Albumin is present, and it may contain hyaline or blood casts.

What is its treatment?

Where the disease is due to the ingestion of irritant drugs their use should be immediately stopped. Rest, poultices applied to the region of the kidney, and abundance of diluent and mucilaginous fluids are indicated.

CHRONIC CONGESTION OF THE KIDNEYS.

What are its causes?

It is due to an increase in the blood-pressure of the kidneys, such as is caused by a valvular endocarditis, pulmonary emphysema, tumors pressing upon the renal veins, or other diseases causing chronic obstruction to the renal circulation.

What are the pathological changes?

The kidneys are generally normal in size, but their weight is increased. The surface is smooth and red, and they seem harder than normal on section. On microscopical examination the smaller blood-vessels are found to be dilated, their walls are thickened, and there is an increase in the amount of connective tissue in the kidneys.

What are the symptoms?

Symptoms referable to this trouble are confined to changes in the urine. The urine is generally diminished in quantity, and the specific gravity is variable. A trace of albumin is often present, but casts are generally absent.

What is the treatment?

Treatment will be that of the primary disease, but great care should be taken to regulate the action of the heart.

PASSIVE CONGESTION OF THE KIDNEYS.

What is the cause?

Any condition of the system which causes venous stasis, such as chronic inflammation of the liver, heart, or lungs.

What is its pathology?

The organs are enlarged, their consistence is increased, they are of a dark-red color, the surface is smooth, and the capsule is not adherent.

What are the symptoms?

The *symptoms*, in general, are those of diseases caused by increase in the general venous pressure, the most marked of which is œdema of the lower extremities. Symptoms due to the disease itself are found in the condition of the urine. The quantity of urine is diminished, its specific gravity increased, the color is high, and it contains a moderate quantity of albumin. A precipitate of urates is mostly apparent on allowing the urine to stand, and hyaline casts are found on microscopic examination.

ACUTE DEGENERATION OF THE KIDNEYS.

What are its causes?

It occurs as a result of the poison of infectious diseases and the ingestion of mineral poisons. It also follows the destruction of extensive portions of the surface of the skin. Fatty degeneration is often combined with this form.

What is its pathology?

The kidney is often enlarged, and the cortex is thickened and of an opaque grayish color. The surface is smooth and the capsule is adherent. On microscopical examination the epithelial cells of the convoluted tubes are found to be swollen and filled with granular material. In the fatty form these cells are also seen to contain fatty molecules, and on close examination the cortex is pale and presents yellowish streaks. Where the disease is due to mineral poisons hemorrhages are often present in the substance of the kidney. The glomeruli are found to be unchanged.

What are the symptoms and treatment?

All *symptoms*, except a diminished quantity of urine, sometimes high in color, are referable to the primary cause of the lesion.

Treatment should be directed to the primary cause.

CHRONIC DEGENERATION OF THE KIDNEYS.

What are its causes?

Long-continued disturbance of the circulation, due to chronic endocarditis or dilatation of the heart, chronic poisoning by alcohol, or other chronic diseases attended by disturbances of nutrition.

What are the pathological changes?

The kidneys are increased in size, the surface is smooth, the cortex is thickened and pale in color, and the pyramids are red. On microscopical examination the epithelial cells of the straight tubes are seen to be swollen and granular or fatty. The capillaries are frequently dilated, and the tubes obstructed by casts.

What are the symptoms?

Symptoms due to the disease itself are progressive loss of flesh and strength and anæmia. In cases where there is partial or complete suppression of urine there may be delirium, convulsions, or coma due to chronic anæmia. The quantity of urine is very variable. The specific gravity is frequently slightly below the normal, but albumin and casts may be present in small quantities.

What is its treatment?

Treatment is directed toward the amelioration or cure of the primary disease, to regulating the circulation, and to improving the general health.

PARENCHYMATOUS NEPHRITIS.

Syn.—Acute exudative nephritis; Tubal nephritis; Desquamative nephritis.

What are its causes?

The disease sometimes occurs from exposure to cold or in the course of local epidemics. It also occurs as a complication of the acute infectious diseases, and of peritonitis, dysentery, erysipelas, diabetes, and pregnancy.

What is its pathology?

The kidneys are generally enlarged, the cortex is thick and white, and occasionally the whole kidney appears reddish in color. On microscopical examination white blood-cells are found in the tubes or in the stroma. The renal epithelium is opaque in color or infiltrated with fat, and the tubes contain casts. In severe acute cases pus is also found in the tubes and pelvis of the kidney.

What are the symptoms?

In mild cases *symptoms* are indefinite, except the change in the urine. In more severe cases there are slight fever, anorexia, lassitude, nausea, and occasional vomiting. In the very severe cases there are also headache, insomnia, delirium, stupor, and convulsions. The heart's action is often feeble and irregular; the pulse is accelerated. Slight dropsy is often present. The urine is diminished in quantity, high in color, the specific gravity is unchanged, and it contains albumin. On microscopic examination it is found to contain casts, red and white blood-cells, and renal epithelium.

What is the prognosis?

Almost all cases recover, but a few run into the chronic form of nephritis.

What is the treatment?

Rest, fluid diet, and the use of narcotics to keep the patient quiet.

The bowels should be kept open by small and frequently repeated doses of saline cathartics. Cupping over the lumbar region and the use of hot-air baths are often beneficial. In cases of weak heart the use of cardiac stimulants is indicated.

ACUTE DIFFUSE NEPHRITIS.

What is meant by acute nephritis?

An increase in both the connective tissue and parenchymatous cells of the kidney, constituting a disease which runs a rapid course.

What are its causes?

It occasionally occurs as a primary disease, but more frequently complicates or follows scarlatina, diphtheria, or other infectious disease. It is sometimes caused by the ingestion of a poisonous dose of alcohol or irritant drugs.

What is its pathology?

The kidneys are enlarged, the cortices thickened, and the cut surface of the kidney may be mottled, red and white, or universally red in color. On microscopical examination the connective-tissue cells are found to be increased, and there is also an increase in the size of the cells lining the glomeruli. The growth of these cells is often seen to be sufficient to press upon the vessel tufts.

What are the symptoms?

The invasion of the disease is often sudden: there are headache, restlessness, insomnia, general convulsions, and nausea, sometimes vomiting, and increased cardiac action, coupled with arterial tension. These *symptoms* may increase in severity, and shortly be followed by delirium, coma, and death, or the disease may pursue a slow course, the symptoms gradually lessening or complete intermissions taking place. In this last set of cases the disease takes a chronic form, dropsy is often present, and the urine is diminished in quantity. Its specific gravity is normal or increased, and it also contains albumin, blood, and epithelial and blood casts.

What are its prognosis and treatment?

Prognosis is always grave, because, should the patient survive any length of time, the disease is very apt to become chronic.

What is its treatment?

Rest abed, stimulation of the action of the skin by means of hot-air baths, or, in cases where the heart is in good condition, hot vapor-baths are of benefit. Dry cupping or the application of poultices over the kidneys is often of great benefit. An abundance of water where thirst exists, and the use of hydragogue cathartics in cases attended by dropsy, are indicated. In this form of nephritis stimulating diuretics are of little

value. The diet should be of the most nutritious and easily assimilated character (such as eggs, oysters, milk, cream). Where the disease occurs in old people or alcoholic subjects cardiac stimulants, as digitalis, strophanthus, or caffeine, must be used.

CHRONIC DIFFUSE NEPHRITIS.

What is chronic diffuse nephritis?

An inflammation of all the tissue-elements of the kidneys, running a chronic course.

What are its causes?

It frequently follows previous acute or subacute trouble of the kidneys, and also occurs as a complication of syphilis or chronic phthisis. In a few cases the disease is apparently excited by frequently repeated indulgence of alcoholic stimulants.

What are the pathological changes?

The kidneys differ very materially in size. The capsule is adherent. The surface is often roughened or nodular. On section the cortex is found thickened and white or gray in color. On microscopical examination the cortical tubes are often seen to be dilated, and the epithelium lining them has undergone fatty or waxy degeneration. The cavities of the tubes are often filled with casts, and there is also found an increase in the interstitial tissue of the kidney.

What are the symptoms?

In almost all cases the *symptoms* are referable to the primary disease. In many cases dropsy is present. Attacks of insomnia and frontal headache often occur. The patient is frequently anæmic, and there may be dyspnœa. In a small number of cases muscular twitchings, followed by coma, due to partial or total suppression of the urine, occur. The pulse is generally accelerated, small, and hard. The urine is increased in quantity. The specific gravity is low, but there is generally a well-marked trace of albumin. On microscopical examination hyaline or granular casts are found. The disease is often attended by complications, such as hypertrophy or dilatation of the heart, endocarditis, pericarditis, bronchitis, cirrhosis of the liver, or chronic gastritis.

What is the treatment?

General treatment consists in regulation of the diet and use of small doses of opium or bichloride of mercury. Where the dropsy is excessive diuretics or cathartics may be necessary. In cases of high arterial tension or threatened uræmia small doses of nitro-glycerin, frequently repeated, and hot-air baths, are of most benefit.

What is the prognosis?

Prognosis as regards recovery is bad, but life may be prolonged in some cases for many years by proper treatment.

SUPPURATIVE NEPHRITIS.

What is suppurative nephritis?

An acute inflammation of one or more kidneys, attended by the formation of small or large abscesses.

What are its causes?

Direct injuries to the kidney occasionally cause it, but the most frequent causes are pyæmia, due to malignant endocarditis or venous thrombi. Occasionally the disease occurs in one kidney without assignable cause.

Suppurative nephritis also follows the extension of inflammation from the bladder or urethra.

What is the pathology?

The kidney is enlarged, and small yellowish-white spots are observed on its surface. These spots consist of accumulations of purulent material. Streaks of grayish purulent material are observed along the course of the pyramids. Colonies of bacteria are always found in the diseased portions. The pelvis of the kidney also contains collections of purulent material, and may be distended.

What are its symptoms?

It generally begins with chills and a rise of temperature. The fever is of an irregular character. The patient loses flesh and strength, becomes anæmic, and nausea and vomiting may be present. There is more or less pain over the region of the kidneys. Should the disease run a chronic course, there may be a tumor over the region of the affected kidney. The urine is diminished in quantity or suppressed. Its specific gravity is increased, and it contains a small amount of albumin, with blood and pus. The urine may also contain broken-down elements of kidney tissue.

What is the prognosis?

In cases due to malignant emboli or occurring in old people the *prognosis* is fatal. Cases due to idiopathic abscess generally run a chronic course, and sometimes recover under treatment.

What is the treatment?

The *treatment* is surgical—*i. e.* incision and removal of the kidney if necessary.

TUBERCULAR NEPHRITIS.

What are its causes?

The presence of tubercle bacilli in the kidney, causing the formation of tubercle tissue, new connective tissue, and frequently accompanied by the formation of abscess.

What is its pathology?

The changes are frequently limited to only one kidney, generally the left. It is also often secondary to tubercular inflammation in other portions of the genito-urinary tract. The kidney is generally more or less infiltrated with pus; there are masses of cheesy material, and an increase of the connective tissue between these masses. The mucous membrane of the pelvis and calyces is similarly affected. A large portion of the kidney may be replaced by the new tissue, which sometimes becomes calcified.

What are its symptoms?

There is generally fever of a hectic type, attended by night-sweats and a quick, small pulse. Loss of health and strength is progressive, though frequently slow. Pain and tenderness over the affected kidney generally exist. The urine usually shows little change, except on microscopical examination. The changes are the presence of blood, pus, epithelium, and shreds of tissue. Occasionally the tubercle bacillus can be found by proper means.

What is the treatment?

Treatment is that of pulmonary phthisis and the complications which may exist.

What is the prognosis?

A few cases recover. The majority result fatally, though the course of the disease is often very chronic.

TUMORS OF THE KIDNEY.

What are the most frequent tumors of the kidney?

Sarcoma and adenoma.

What is their pathology?

They originate in the kidney or its pelvis. The sarcomata are frequently of large size, are of firm consistence, and consist of embryonal connective tissue, with mucous or muscular tissue generally present in variable amounts. They most frequently occur in infancy or childhood. The adenomata are tubular or papillary in type, and often malignant.

What are the symptoms?

The presence of a tumor over the region of the kidney, pressure upon which causes more or less pain, and the cachexia which is found existing with the presence of malignant tumors. The urine frequently contains blood, though this is not a constant symptom.

What is the treatment?

Removal of the tumor by surgical means.

RENAL COLIC.

What is renal colic?

An attack of pain, caused by the presence of a calculus in the pelvis of the kidney or the passage of such calculi through the ureter.

What are the pathological causes?

Inflammation of the mucous membrane of the pelvis of the kidney or any condition of the system, such as gout, rheumatism, or that produced by a sedentary life, which causes the production of an abnormal quantity of uric acid, oxalate of lime, phosphates, or of cystine, may give rise to the production of the stone. On examination the stone is found in the pelvis of the kidney, in the ureter, or in the bladder. The stone may consist of uric acid or of a uric-acid centre surrounded by a shell of the other constituents of the urine which are able to be precipitated. On section the stone frequently presents the appearance of concentric layers.

What are the symptoms?

The passage of minute stones (sand and gravel) is generally attended by only a feeling of discomfort. Should the stone be larger and become loose in the pelvis of the kidney, its passage into the ureter, and from thence to the bladder, is attended by a sudden severe pain in the loin and side of the abdomen of the affected kidney. The pain often runs down the inner surface of the leg of the affected side and into the scrotum. There is retraction of the testicle, which may occasionally be swollen and painful. Should the attack be severe, it is often attended by vomiting, fainting, and, rarely, general convulsions. The pulse is short and quick, and there is slight fever in severe cases. The urine is generally passed frequently in small quantities, and may contain blood. If the attack has been caused by the passage of a number of small stones, these symptoms will recur with periods of intermission. Most attacks only last for a few hours under treatment.

What is the treatment?

Treatment is directed to the relief of pain and the hastening of the passage of the stone. Hot hip-baths, poultices over the kidneys, and small hypodermics of morphine will often cure the attack. Should the attack persist or recur, the use of inhalations of ether or chloroform for the relief of pain may be necessary.

What is the prognosis?

Most patients have recurrent attacks of colic, and *prognosis* will depend on whether the stone lodges in the ureter, passes into the bladder, or is ejected with the urine. In all cases where there are symptoms of the retention of the stone in the bladder or ureter the prognosis is grave, as the treatment is necessarily surgical. In cases where there are symptoms of a retained stone in the pelvis of the kidney the prognosis is also grave.

PERINEPHRITIS.

What is perinephritis?

An inflammation of the connective tissue around the kidney, generally leading to the formation of an abscess.

What are the pathological changes?

The kidney is surrounded by an abscess, which may extend into the muscles of the back or into the cavities of the neighboring viscera. The kidney is often itself compressed by the surrounding pus and the seat of small abscesses.

What are the causes?

It is generally produced by an extension of chronic inflammation of neighboring parts, such as caries of the spine or pelvic cellulitis. It sometimes complicates acute infectious diseases, as small-pox and typhoid and typhus fever. It may also be caused by direct injury to the lumbar region.

What are the symptoms?

The disease is generally ushered in by chills and a febrile movement. Pain and tenderness over the lumbar region are quite constant, as is also nausea. The patient is somewhat prostrated, remains in bed on his back, and lies with the thigh of the affected side flexed, as movement of it gives pain. In a few days a swelling in the lumbar region, caused by the increase of the abscess, often appears. Should the abscess perforate the surrounding viscera, symptoms due to this accident will be added to those due to the formation of the abscess itself.

What is the treatment?

In the earlier stages of the disease small doses of sulphate of magnesia or calomel internally, and the application of continuous cold to the lumbar region, may be employed. Should the formation of pus be suspected, exploration with the hypodermic needle or aspirator is called for. Should pus be found, an immediate operation is necessary.

What is the prognosis?

In cases where the abscess is detected early and operated upon, recovery sometimes occurs. Where the abscess perforates the pleura, colon, or bladder the disease generally runs a chronic course, accompanied by waxy degeneration of the viscera and followed by death. Where the abscess penetrates the peritoneum the prognosis is always fatal.

GLYCOSURIA.

Syn.—Diabetes mellitus.

What is glycosuria?

A presence of sugar in the urine.

What is its etiology?

It may be temporary or permanent. It is often caused by certain poisons, and is frequently present, temporarily, in the course of acute infectious diseases, functional disorders of the liver, cerebral apoplexy, concussion of the brain, and pregnancy. The disease is twice as common in men as in women, and generally affects young and middle-aged adults.

What is its pathology?

The nature of the disease is obscure. In some cases the pancreas is found to be small, the liver fatty, and the kidneys show the changes of chronic nephritis. Changes in the blood-vessels of the medulla have also been noticed.

What are the symptoms?

The onset of the disease is generally slow and gradual; patients have a feeling of lassitude and unnatural thirst, and pass an abnormally large quantity of urine, which contains sugar. There is progressive loss of flesh and strength, with disturbance of the functions of the digestive tract. These *symptoms* may last for a long time, and be complicated by furunculosis, nephritis, gangrene of the extremities, or cataract. Should a fatal termination occur, the symptoms of diabetic coma may be as follows: After exertion the patient feels suddenly weak, the skin is cold, the pulse feeble; he becomes comatose, and dies in a few hours. Or there may be sudden headache, dizziness, stupor, coma, and death; or for a few days the patient complains of weakness, loss of appetite, slight drowsiness, and abdominal cramps, which symptoms are followed by restlessness, delirium, dyspnœa, cyanosis, and feeble heart-action. Coma comes on in a few days, followed by death.

What is the treatment?

Regulation of the diet and mode of life is most important. No sugars or starches should be eaten. The use of wines or liquors should also be avoided. In regard to drugs, the preparations of opium, combined with the use of alkalies, are most frequently used. Sulphide of calcium, 1 grain four times a day; solution of bromide of arsenic, 10 minims three times a day; and jambol in powder, 10 grains three times a day, may be used.

What is the prognosis?

A few cases recover completely, and in the majority of cases the disease can be controlled and the patients have fair health for a long time. *Prognosis* will depend somewhat on the age of the patient, children doing very badly.

DIABETES INSIPIDUS.

What is diabetes insipidus?

A disease characterized by the passage of large quantities of urine with a low specific gravity.

What is its etiology?

It is not due to disease of the kidneys, and its causes are unknown. It is more common in males than in females, and usually occurs in young adults.

What are the symptoms?

The patients pass large quantities of urine of low specific gravity. They have great thirst, attended by disturbances of digestion and symptoms of hysteria.

What is the treatment?

Attention to the diet, which should consist principally of nitrogenous food. The use of ergot and gallic or the mineral acids is often followed by marked benefit. The disease usually runs a chronic course, but is rarely if ever fatal.

HÆMATURIA.

What is hæmaturia?

The presence of blood in the urine.

What is the etiology?

In tropical countries it occurs as a symptom of the presence of the distoma-worm in the vessels of the bladder or those of the portal system. The condition also occurs as a symptom of acute and chronic Bright's disease, pyelitis, cancer of the kidney, renal congestion, tubercular inflammation of the kidney, and, rarely, as a symptom of hemorrhagic infarction of the kidney. The ingestion of certain drugs may also give rise to a bloody appearance of the urine (false hæmaturia). In hemorrhage occurring from the bladder pure blood is passed after micturition. The urine does not pass freely, and the presence of calculus or vesical tumor may often be determined by surgical examination. In cases of hemorrhages from the ureter there are often signs of impacted renal calculus. If examination shows the presence of blood-casts, the diagnosis of nephritic hæmaturia is rendered certain.

What is the treatment?

Internally the use of hæmostatics, as acidum tannicum, ergot, iron, or alum, and externally the use of the ice-bag over the bladder and kidneys, are followed by good results.

HÆMOGLOBINURIA.

What is hæmoglobinuria?

An affection characterized by the presence of the coloring matter of the blood in the urine, with the absence of blood-corpuscles.

What is the etiology?

A pathological condition of the blood. It occurs in the course of scurvy, purpura hæmorrhagica, hemorrhagic small-pox, typhoid fever, measles, and scarlet fever. It has also been observed as a result of phosphorus-poisoning. Exposure to cold seems to be often an immediately exciting cause.

What are the symptoms?

The attacks generally come on in the late fall or winter; they are paroxysmal in character, and may be more or less severe. Jaundice occasionally occurs. The patient is attacked by a well-pronounced chill, lasting half an hour or longer, and followed often by fever and sweating. During or following the chill the urine voided is of a dark-red color. Microscopic examination shows the presence of brownish-colored sediment in the urine, consisting of granular matter, but the absence of red corpuscles. Granular and hyaline casts are also often observed. After the paroxysm the urine becomes clearer, and in twenty-four hours is normal.

What is the treatment?

During the paroxysm rest in bed, internally hot drinks with some alcoholic stimulant, and heat externally to the surface, are advised. Between the paroxysms a mild and uniform climate, with the use of chalybeate tonics and a generous diet, may prevent future attacks.

CHYLURIA.

What is chyluria?

A disease characterized by the passage of urine resembling milk.

What is its etiology?

It is most frequently found in tropical countries, and is sometimes associated with hæmaturia. In some cases chyluria is apparently caused by the presence of a parasite. This parasite is a worm $\frac{1}{75}$ of an inch in length, found most frequently in the blood and urine examined at night. This worm is called the *filaria sanguinis homines*. After death vast numbers of these worms are found in the cortical and pyramidal portions of the kidney.

What are the symptoms?

Attacks generally occur without any appreciable exciting cause and without premonition. The chyluria occurs intermittingly, and the at-

tacks are as irregular as the duration and occurrence. In very severe cases there are lumbar pains, a feeling of lassitude, and other symptoms of physical exhaustion.

What is the treatment?

Ergot, gallic acid, 1 to 2 drachms to be given in twenty-four hours, and spirits of turpentine, 5 ♏, *t. i. d.*, have been used. Large draughts of astringent infusions may be of benefit.

DISEASES FROM DISTURBANCE OF THE BLOOD-FORMING FUNCTIONS.

SIMPLE ANÆMIA.

What is simple anæmia?

A disease characterized by decrease in the number of the cellular elements of the blood, which tends to recovery under suitable treatment.

What is its etiology?

It often occurs associated with chronic diseases. It is also seen as a result of confinement in ill-ventilated rooms. Women are more subject to it than men. It also results from the action of certain poisons, such as zinc, lead, phosphorus.

What are the symptoms?

The *symptoms* are very varied. Those pertaining to the nervous system are mental depression, mental irritability, a feeling of lassitude and incapacity for muscular exertion, functional palpitation of the heart, neuralgias in various situations, and occasionally hysterical phenomena. The respirations are often increased in frequency, and dyspnœa may be present. As a result of non-assimilation of food, nausea, and even vomiting after meals, epigastric pain, and eructations of gas, are often seen. The urine is light in color and of low specific gravity. The amount is frequently increased. The mucous membranes are pale, and the surface of the body is generally cool. On auscultation the action of the heart is found to be feeble and often irregular. At the base of the heart a systolic murmur is often heard, and in the neck is heard a continuous murmur known as the venous hum. Examination of the blood will frequently prove whether the anæmia is benign or pernicious.

What is the treatment?

Besides the treatment of the causative disease where it is ascertainable, patients should be given plenty of fresh air and out-door exercise. The body should be sponged daily and well rubbed. The bitter tonics before meals and the use of artificial digestants are necessary in cases with gastric dyspepsia or catarrh. Food should be of the most nutritious quality, and care must be exercised not to give too much at one meal. The preparations of iron are always of benefit. The powdered

lactate of iron seems to be the best form of administration in cases of children or young women.

CHLOROSIS.

What is chlorosis?

A form of anæmia in which there is a reduction in quantity of hæmoglobin in the red corpuscles, with or without a diminution in their number.

What is its etiology?

It occurs most frequently in girls between the ages of fourteen and twenty-four years. It shows itself as a persistent simple anæmia. The *cause* is often obscure, but is evidently connected with the development of the sexual system. Patients affected with simple anæmia, when they are subjected to great mental shock or are victims of masturbation, often develop chlorosis.

What are the symptoms?

The *symptoms* are those of a very marked simple anæmia, and to these are often added choreic symptoms or attacks. Also perversion of the appetite is often shown by a craving for non-nutritious substances.

What is the treatment?

General treatment is the same as that of simple anæmia. Encouraging the patient with hopes of complete recovery and occupying the patient's mind with congenial tasks are important elements in cure.

PERNICIOUS ANÆMIA.

What is pernicious anæmia?

A disease characterized by the symptoms of simple anæmia, but having added to them fever, marked heart murmurs, hemorrhages into various tissues of the body, and progressive exhaustion, attended with various abnormal changes in the blood.

What are the etiology and pathology?

The etiology in many cases is obscure. Many observers regard it as an intense simple anæmia. Conditions of life leading to prolonged inanition predispose to it. Endemic influences also have a causative relation to the disease. It is somewhat more frequent in women than in men, and is generally observed between the ages of twenty and forty. The red corpuscles are reduced from the normal number from one-tenth to one-third. The percentage of hæmoglobin may also be decreased. Large corpuscles are often observed in the blood, but smaller white corpuscles are often observed in abnormal numbers. The blood coagulates less perfectly than in health. Fatty degeneration of the myocardium, of the hepatic cells, and of the renal epithelium has been observed. In

the long bones the normal yellow marrow often has a red appearance, due to granular matter and nucleated red corpuscles. In a few cases the medulla of the bones presents a greenish appearance. Small extravasations of blood are often found in the retina, the meninges of the brain, and the serous membranes.

What are the symptoms?

The onset is often gradual. There is a feeling of lassitude and anorexia, with slight chilly sensations. These symptoms are followed by nausea and vomiting and slight epistaxis. The patient at times has an anxious look, but may not have the pallor of simple anæmia. Occasionally emaciation sets in early in the disease, and is progressive. Attacks of a regular fever soon develop, and are frequently attended by severe epistaxis or hemorrhages from the gums or serous membranes. An impairment of vision from retinal hemorrhages is usually observed. Examination of the heart shows the presence of a loud systolic murmur over the base.

The *duration* of the disease is from four weeks to several months. Most cases end fatally.

What is the treatment?

Treatment is the same as that of simple anæmia; but especial care must be taken to administer concentrated foods, and the patient should be kept quiet in a sunny room with an even temperature.

LEUCOCYTHÆMIA.

What is leucocythæmia?

A chronic disease of the blood characterized by an excess of white corpuscles and a diminution of the red corpuscles in the blood.

What are the etiology and pathology?

The *causes* are very obscure. A disturbance of function of the splenic or lymphatic glands has some relation to the production of the disease. It occurs in three forms—the *splenic*, *lymphatic*, and *medullary*. These forms are usually combined with each other. On examination the blood is often opaque and paler than normal. There is great diminution in the number of red corpuscles. A considerable increase of the white corpuscles above normal is found. The corpuscles may contain granular or molecular fat. The spleen is enlarged and the capsule is often thickened. On section it presents a mottled appearance from the presence of Malpighian bodies as whitish dots or infarctions of a dark-red or yellowish color. On microscopical examination the elements of the spleen are found to be increased in size and number. In cases involving the lymphatic system many lymphatic glands are found to be larger or smaller than normal, and their color is gray or reddish gray. The microscope shows an increase of lymphoid cells in the substance of the glands. The

same increase of lymphoid cells is sometimes found in the pharyngeal tonsil, the tonsils, and the *solitary* glands of the intestine. In the bones the changes are usually found in the marrow of the ribs, the sternum, and the vertebræ. The marrow has a reddish or greenish appearance, and is of a soft, pulpy consistence. In a few cases the marrow is of a dark-red color and of a gelatinous consistence. The diameter of the long bones may be found increased beyond the normal, but this is due to encroachment of the medulla upon the hard outer portion of the bones. The kidneys are frequently enlarged.

What are the symptoms?

The disease comes on very slowly. General lassitude, gastric dyspepsia, and disinclination to exertion are often present for a considerable period. Pallor of the face and mucous membranes takes place, and physical examination at this time will often show tenderness over the spleen and marked enlargement of that organ. Swelling of the lymphatic glands occurs, especially of those of the neck and axilla. The mesenteric glands are also sometimes enlarged. Dyspnœa occurs, and is often exaggerated by the enlargement of the liver or spleen. Ascites or hydrothorax occurs sooner or later in most cases. The action of the heart is much increased and a hæmic murmur is often audible at the base of the heart. The temperature is generally raised, especially in the evening. Hemorrhages from the mouth, nose, throat, pharynx, or the intestinal organs are frequent symptoms. As a result of gastro-intestinal disturbances diarrhœa is a frequent symptom; jaundice rarely occurs.

This disease lasts generally two years, but it may run a rapid course or be prolonged for a long time. It occurs most frequently between the ages of twenty and fifty years.

What is the treatment?

Internally the use of quinine, ergotin, iodide of potassium, and externally cold douches and faradization of the abdomen, have been recommended. No other remedies beyond general tonic treatment have seemed to be of any value.

PSEUDO-LEUCOCYTHÆMIA (HODGKIN'S DISEASE).

What is pseudo-leucocythæmia?

An affection in which blood-changes similar to those in leucocythæmia occur, but unattended with an increase of the white corpuscles of the blood and accompanied by marked swelling of the lymphatic glands.

What are its etiology and pathology?

It generally occurs between the ages of ten and thirty years; the exciting causes are obscure. The lymphatic glands of the neck or abdomen are frequently enlarged, the increase being due to a proliferation of the lymphatic cells and of the cells of the reticular network. The swollen glands are grayish or yellowish-white in color; where many neigh-

boring glands increase in size, they may coalesce and form a firm, hard mass. If the glands are subcutaneous, the skin over them is generally freely movable. The affection often first attacks the cervical glands. The spleen is generally enlarged, but not so much so as in cases of leucocythæmia. In the kidneys and liver nodules composed of lymphoid tissue are often present, and these nodules may be formed in other organs of the body.

What are the symptoms?

The glandular enlargement comes on slowly, and is attended by a feeling of lassitude, a quick, feeble pulse, anorexia, nausea, and occasionally vomiting. These initial symptoms are followed by progressive exhaustion, submucous or subcutaneous hemorrhages, progressive anasarca, due to the anæmic state of the patient; and symptoms referable to pressure caused by the enlarged glands, as dyspnœa, due to enlarged peribronchial or mediastinal glands; dysphagia, due to lymphomatous growths in the throat or enlargements of the lymphatic glands around the œsophagus; aphonia or persistent cough, due to pressure of enlarged glands on the larynx or laryngeal nerve; irregular cardiac action, due to pressure on the pneumogastric nerve. The disease may last from a few weeks to many years. *Prognosis* is always grave.

What is its treatment?

The *treatment* is, internally, the use of arsenic alone or combined with iodide of potash; externally, the application of iodine or of hot poultices to the superficial glands gives some relief. The injection of enlarged glands with carbolic acid, iodine, or nitrate of silver is sometimes employed. In cases of enlarged glands, threatening life by their local pressure, the excision of the gland by surgical measures will often be followed by temporary relief.

ADDISON'S DISEASE.

What is Addison's disease?

A disease characterized by a pigmentation of the skin, constitutional disturbances, and changes in the suprarenal capsules.

What are the etiology and pathology?

The etiology is obscure, but may be due to some disturbance of a function of the sympathetic nerve. The skin has a dusky or yellowish-brown hue, especially on the parts most exposed to the air. The suprarenal capsules are found imbedded in a mass of fibrous tissue, their connective tissue is increased in amount, and the stroma is often changed to a caseous mass containing large lymphoid cells. The mesenteric glands in the neighborhood of the suprarenal capsules are often enlarged and the seat of cheesy degeneration. Examination of the blood generally shows a diminution of the red blood-corpuscles.

What are the symptoms?

The symptoms come on slowly, and begin with a feeling of lassitude, very slight dyspnœa, and slight cardiac palpitation on exertion; these are followed by feeble heart-action, anorexia, nausea, and vomiting. There are also muscular pains in the loins and across the abdomen; the weakness increases progressively, and frequently the vomiting becomes persistent; the bowels are generally constipated, but diarrhœa may set in at at the end. The discoloration of the skin comes on gradually in the course of the disease. The disease is progressive and ends in death, sometimes preceded by coma or convulsions. Care should be taken to diagnose this from the cutaneous discoloration caused by skin diseases and drugs.

What is the treatment?

Treatment is simply symptomatic.

GENERAL DISEASES.

ACUTE ARTICULAR RHEUMATISM.

What is acute articular rheumatism?

A disease characterized by fever and enlargement, redness, and pain of one or more joints of the body.

What is its etiology?

An especial disposition to the disease as a predisposing cause. It occurs in all ages, and a primary attack is often followed by others. Suppression of the functions of the skin, owing to the action of cold, seems to be the immediate exciting cause of an attack.

What is the pathology?

The affected joints are swollen, reddened, and tender; the normal amount of synovial fluid in them is increased, and it is often turbid, from the presence of flocculi of fibrin. Inflammation of other serous or mucous membranes is often observed, as inflammation of the pericardium or endocardium.

What are the symptoms?

Occasionally pain and a soreness of the joints precede the acute *symptoms*. There is a sudden attack of pain in some of the joints. This may be ushered in by a chill, but fever is always present. The affected joints become enlarged, very tender on movement, and the skin over them hot and reddened. Pressure on the affected joints causes much pain. In some cases the large joints are affected simultaneously or in quick succession. In other cases the disease is limited to a single joint for a longer or shorter time. The joints most frequently affected are the knee, ankle, wrist, shoulder, and hip, less frequently the elbow and the small joints of the hands and feet. There is generally sweating at night, and often

miliary vesicles appear on the neck or chest. Anorexia is present, the tongue is coated, and the saliva acid. Constipation generally is present. The urine is diminished in quantity, very acid, high in color, and contains a large excess of urates. In many cases the inflammation attacks the lining or enveloping membrane of the heart, in which cases symptoms of endo- or pericarditis are added. In a few cases, owing to very high temperature or other causes, delirium occurs.

The *duration* of an acute attack varies greatly, but the average is about three and a half weeks. The disease of itself is rarely fatal.

What is the treatment?

Salicylic acid and the salicylates are most frequently used in the *treatment* of the disease. For the relief of pain in the inflamed joints small doses of opium internally and bathing the joints with a saturated solution of bicarbonate of soda give relief. Alkalies combined with soluble salts of iron are often given with benefit. In the use of salicylic acid or the salicylates in large doses the patient should be carefully watched for the cumulative action of the drug. In cases where the articular pain is very distressing, immobilization of the joints by means of well-padded splints is advisable.

SUBACUTE RHEUMATISM.

What is subacute rheumatism?

An attack of rheumatism which lacks the intensity of the acute form, runs a longer course, and is often attended with remissions and exacerbations. The *symptoms* are those of a mild attack of acute rheumatism, and *treatment* is similar.

CHRONIC RHEUMATISM.

What is chronic rheumatism?

A rheumatic inflammation of the joints, generally following a subacute attack and running a chronic course.

What are the symptoms and treatment?

The affection does not shift from joint to joint, as in cases of acute rheumatism. The affected joints are tender and painful to the touch, somewhat enlarged, and their surfaces reddened. Motion is painful, and often attended with a grating sensation in the joint. Fever is generally absent, and the tendency to cardiac complications is slight. In the course of time the affected joints often become stiff and ankylosed.

For *treatment* internally the preparations of guaiacum, iodide of potassium, arsenic, or colchicum, singly or combined, give the best results. *Local treatment* of infected joints is important. Between the attacks of pain massage and counter-irritation of the affected joints are useful. If attacks of pain come on, immobilization of the joints, with the local application of heat, gives relief. Attention should be paid to the general

health and having the patient wear warm under-clothing, as sudden changes in the weather seem to have a causative relation to the attacks.

GOUT.

What is gout?

A disease resembling rheumatism which may occur in an acute, subacute, or chronic form, and is characterized by an excessive formation of urates in the body and the symptoms caused by their presence, chiefly in the joints.

What are its etiology and pathology?

Heredity is one of the great factors in the production of gout; it is a disease principally occurring in adult life or subsequently. Exposure to cold or over-indulgence in food or stimulants occasions attacks in those predisposed to the lesion. Men are said to be more liable to the disease than women. Cases of acute gout are most frequently observed in the spring and fall. The pathological characteristics of the disease are deposits of urate of sodium in the form of white chalk-like incrustations upon the free surface and in the substance of the articular cartilages. These changes in early stages of the disease are found in the smaller joints. Later the deposits may occur in the large joints or in the tissues surrounding them. The affected joints are enlarged, the external surface is often red, and frequently the deposits (tophi) external to the joint break through the skin. In old cases the articular cartilages are often eroded, giving rise to marked crepitation on movement. The kidneys are usually small in size, the capsule is adherent, and the surface of the kidney granular; white lines are seen in the pyramidal portion of the kidney, due to the deposit of urate of sodium. This is found both within the tubes and the interstitial tissue.

What are the symptoms?

The disease may come on suddenly or slowly. In acute gout there is sudden pain, often coming on at night, in one of the small joints. This may be preceded by cardialgia, eructations of gas, and mental depression. The pain is generally of a boring character, attended with throbbing in the affected joint. More or less elevation of temperature is present; the affected joint rapidly becomes swollen; the skin covering it is red and shining, and excessively tender to touch. These symptoms often subside during the day, to return again in one or more nights. The joints of the great toe are those most frequently affected, but in prolonged attacks other joints are often implicated. The bowels are generally constipated. Urine is high-colored, scant in amount, and overloaded with an abnormal amount of urates and phosphates. The perspiration is very acid, and erythema may be present from irritation of the skin. In subacute gout all these symptoms are present, but are less severe, and the attack is generally of longer duration. Should the symptoms persist for many weeks, the disease must be regarded as chronic.

Chronic gout begins with recurrent attacks of acute gout, though sometimes the disease comes on slowly and assumes the chronic form from the first. In this form the fever, intense pain, heat, and redness of the affected parts are frequently wanting. The general health is often impaired, and symptoms of gastric dyspepsia exist. The affected joints are enlarged, have solid or semi-liquid chalk-like deposits within or around them, and tend to become stiffened and ankylosed. Deformity of the joints is also a marked symptom. Deposits of urate of sodium are also noticed in the ear, the eyelids, or various portions of the extremities. The shoulder- and hip-joints are rarely affected. Acute exacerbations often occur in the course of the chronic form of the disease, and these are frequently excited by injudicious use of particular kinds of foods or stimulants.

Occasionally the gouty diathesis manifests itself by various disorders of the functions of the viscera. These consist of sudden attacks of pain in the stomach, attended with nausea and vomiting, or of sudden general colicky pains (in the abdomen), with diarrhœa; and to these are often added an irregular action of the heart, cough, dyspnœa, and neuralgic pains in the main nervous trunks.

The urine in these chronic and anomalous forms of this disease is generally abundant, normal in color, and deposits but little sediment. It may contain a trace of albumin, but casts are generally absent unless the disease is of long standing.

What is the treatment?

For the acute attacks hot poultices to the affected part, and internally the use of alkalies in combination with colchicum, may be used. The salts of lithia are also often given. For the relief of the pain small doses of opium, combined with hyoscyamus, belladonna, or aconite, are indicated. The diet should be restricted, nitrogenous food being excluded during the acute attack. Large draughts of hot water, frequently repeated, are of use as a diuretic. In the chronic form local treatment of the affected parts is of little value. The diet should be nourishing and adequate for purposes of nutrition. All highly-seasoned food and wine should be excluded. Internally, iodide of potash and colchicum, with the free use of alkaline mineral waters, are recommended.

ARTHRITIS DEFORMANS.

What is arthritis deformans?

A chronic disease dependent upon an abnormal condition of the blood, resulting in a partial destruction and deformity of the joints, unattended by the constitutional symptoms occurring in either chronic articular rheumatism or gout.

What are the etiology and pathology?

The remote *causes* are obscure. The disease may occur at all ages,

but is commonly observed in middle life, and oftener in women than in men. Exposure and hardships are often exciting causes. The pathological changes occur in all parts of the joints. The articular extremities of the bones become enlarged, owing to a growth of new cartilaginous and osseous tissue. The cartilaginous articular extremities of the bones are often absorbed, particularly in their centres. The normal villous outgrowths of the synovial membrane are much increased in size and number, and may be changed into cartilaginous or osseous tissue. The pedicles of these nodules often break, and the nodules remain as foreign bodies in the articular cavity. The ligaments surrounding the joint become much thickened, owing to deposits of cartilage in them; the bones are often rendered immovable. Dislocations or subluxation of the joints may occur from the absorption of the ligaments and articular cartilages. Where the joints have become immobile the muscles attached to them are often atrophied from lack of use. On microscopical examination there is found a proliferation of large cartilage-cells around the edges of the joints and in the ligamentous tissue surrounding them. After the disease has existed for a short time the synovial fluid is very much decreased in quantity or may be entirely wanting.

What are the symptoms and treatment?

The progress of the disease is slow, but the smaller joints may be first affected. Chalky deposits in the joints are wanting, and there seems to be no liability to pericarditis or endocarditis. Fever is absent, and there is little constitutional disturbance. The appetite and digestion, as a rule, are but little affected. The affected joints are enlarged and painful, especially on motion. Crepitation is generally present, but the skin covering the affected joint is not red or shiny. As the disease progresses the joints become disturbed and their motion impaired. In this disease the larger joints are frequently affected first, and in the smaller joints those of the fingers are often affected previously to those of the toes. The disease is also unattended by the paroxysms and acute exacerbations characterizing gout. The urine often does not contain an excess of uric acid.

The *treatment* must be mainly symptomatic and directed to check the progress of the disease, as the deformity of the joints is incurable. A nutritious diet and a building up of the system by iron and other tonics are most important. The remedies used for chronic rheumatism and gout are of little value. Iodine, hot baths, and passive motion applied to the affected parts are useful. The use of hot mineral and mud-baths is often beneficial.

SCURVY.

What is scurvy?

A disease characterized by extravasations of blood into the skin and serous membranes, and the presence of ulcerations in various portions of the body.

What are the etiology and pathology?

It is supposed to be caused by the want of vegetable acids in the dietary of the patient. It is more prevalent during the winter than in the summer, and is most frequently seen in those whose constitution is much run down. The composition of the blood is changed, and some ascribe the change to the lack of the potash salts. Extravasations of blood often appear before and after death beneath the skin and also between the bundles of muscular fibres. The tongue, the gums, and the buccal mucous membrane are often swollen and frequently ulcerated. Ulcerations sometimes occur on the inner surface of the synovial membranes, and the synovial fluid may be tinged with blood. Ecchymoses are frequently observed on the surface of the serous membranes. The spleen is enlarged, and the heart, liver, and kidneys may be in a condition of parenchymatous or fatty degeneration.

What are the symptoms and treatment?

The patient usually complains of general weakness and disinclination to exertion; an anæmic appearance is present, and anorexia becomes marked. These *symptoms* become progressively worse. The gums are swollen and have a spongy appearance. Hemorrhages are frequent from them, and also from the nostrils, vagina, and intestines. The breath is generally offensive. Ecchymoses appear spontaneously on the skin, and are frequently caused by the slightest blow. The skin is dry and rough. An œdema of the lower extremities or the face soon takes place. There is palpitation and dyspnœa on exertion, and a systolic anæmic murmur is frequently heard over the base of the heart. The urine is scanty and high-colored. Fever is generally absent. The pulse is soft and compressible, but its rate varies greatly in different cases. Disturbance of the mental faculties does not occur, but obstinate insomnia is frequently present. Muscular pains in the lumbar region and lower extremities are frequently observed. Death occurs in some cases from heart failure, due to over-exertion; in other cases from hemorrhage into the meninges or into the pericardial or pleural cavities, or from exhaustion, due to repeated and profuse hemorrhages into the outlets of the body. Where the disease is recognized early and proper treatment can be given, the cases generally recover. The prevention of the disease by the use of fresh acid fruits is very important. Where the disease is established easily-digested nutritious food and the internal use of the bitter tonics, mineral acids, and the preparations of iron are indicated; the salts of potassium should also be given in small doses. For the ulcerations, antiseptics, and if in the mouth astringents added, give relief.

PURPURA HÆMORRHAGICA.

What is purpura hæmorrhagica?

A disease characterized by extravasations of blood into the skin and mucous membranes.

What are its etiology and pathology?

The *causes* are obscure, but the hemorrhage seems to depend upon an abnormal condition of the coats of the capillary vessels, due to vaso-motor disturbance. There is also some morbid change in the blood. The extravasations may consist of petechiæ or large ecchymoses. They resemble those occurring in scorbutus, but extravasations into the muscles, the joints, and viscera are uncommon.

What are the symptoms?

The disease is most apt to occur in the summer or autumn. It sometimes begins insidiously with gradually increasing mental depression and physical weakness, and then comes the appearance of the hemorrhagic spots on the body, followed by more or less profuse hemorrhage from the mucous membrane of the nose, mouth, or intestinal tract. In other cases the disease begins with fever, headache, a quick, rapid pulse, loss of appetite, and an increasing prostration. There is also pain in the back, limbs, and joints. The larger joints frequently swell in a manner similar to that of acute rheumatism. In the more severe cases hemorrhages from the mucous membranes occur; the patient becomes anæmic in appearance, and may die from exhaustion.

This affection is sometimes seen as a complication of infectious diseases (typhus, typhoid, meningitis).

What is the treatment?

General treatment consists of a nutritious diet and the internal use of small doses of wine and of tonic remedies, such as dilute sulphuric or hydrochloric acid, and the tincture of the chloride of iron for the arrest of the hemorrhages. Gallic acid or ergot internally is recommended.

HÆMOPHILIA.

What is meant by hæmophilia?

A liability to excessive bleeding, occurring either idiopathically or as the result of very small or insignificant lacerations. The disease seems to be hereditary in many cases, but it will sometimes skip a generation in the family so affected. Men are oftener affected than women. The disease may show itself directly after birth by bleeding from the umbilicus, but the diathesis is generally first manifested during or shortly after dentition. It will occur from the slightest wounds, and also take place without assignable cause from the nostrils, and sometimes from the bronchial tubes, stomach, intestines, and kidneys. The blood seems to be less coagulable than normal, and the inner lining membrane of the arteries has been found to be very thin. Some disorder of the vaso-motor nerves seems to be a factor in the production of the disease.

The *treatment* consists of tonics and hæmostatics internally, and the use of styptics in cases of hemorrhage locally.

DISEASES OF THE NERVOUS SYSTEM.

DISEASES OF THE PERIPHERAL NERVES.

DISTURBANCES OF SENSATION.

SENSATION may be diminished or absent (anæsthesia) or increased (hyperæsthesia). In anæsthesia a strong irritation produces a weak reaction or none at all; in hyperæsthesia a weak irritation produces an exaggerated reaction. We have special nerve-fibres for the tactile sense, which is measured by means of objects applied to the skin; the sense of locality, tested by means of a compass, the two points of which are applied to the skin; the sense of pressure, tested by the application of weight to different parts of the skin; the sense of temperature, tested by means of tubes filled with hot and cold water; the sense of pain, tested by means of a pin; and electric sensation, tested by means of the electric current. We also distinguish muscular sensibility, or the power to judge of our motions without the aid of our eyes. We find anomalies of all these sensations in the various nervous affections.

ANÆSTHESIA OF THE SKIN.

What is anæsthesia of the skin?

A partial or complete absence of sensation over a certain area of the cutaneous surface, due to interruption in the conducting power of the sensory nerves.

What are the etiology and pathology of anæsthesia?

The sensory nerve-fibres, after reaching the spinal cord, pass through the posterior columns (and the "columns of Goll") of the opposite side to the medulla and the internal capsule, and the centre is situated in the posterior third of the posterior limb of this capsule. Anæsthesia may be due to affection at the cutaneous end of the nerve (chills, narcotics, ether, injury, local disturbance of circulation), or to affection along the track of the nerve (traumatism, inflammation, new growths), or to affection in the spinal cord (locomotor ataxia, inflammation, new growths), or to affection of the cerebrum (hemorrhages in the internal capsule, hysteria, effect of anæsthetics on the brain). Anæsthesia may also be caused by infectious diseases, and sometimes by syphilis.

What are the symptoms of anæsthesia?

The patient may notice that in some part of his skin sensation is not normal. He does not feel the pressure of his clothing, small objects drop

from his hand, as he does not feel their presence, although in cases of hysteria the anæsthesia may be extensive without the patient being conscious of it. It may be combined with a feeling of pain or of numbness or trophic disturbances. Voluntary motions are executed with ease, but become more difficult when the eyes are closed. Anæsthesia is rarely an independent affection, but mostly a symptom of other diseases of the nervous system. The *prognosis* therefore depends on the causative disease. The patient is liable to receive injuries, scalds, burns, and cuts without being aware of the injury. In anæsthesia of the trigeminus nerve the face is usually bloated and the temperature on the affected side is somewhat lower than that of the other, the tongue loses its power of taste on the anterior two-thirds, and ulcers easily form on it from bites that are not felt.

What is the treatment of anæsthesia?

If we can discover the primary cause of anæsthesia, we must try to remove that. If the cause is obscure, we may use with good effect a faradic or galvanic current, especially in cases of hysteria. Massage or rubbing with various liniments is very useful. The affected parts should be protected against injury. The use of strychnine internally is advised.

NEURALGIA.

What is neuralgia?

Pain occurring in the course of nerves and in their area of distribution. The pain has remissions and intermissions, and is due to some morbid affection of the nerves of sensation or their spinal or cerebral centres.

What are the etiology and pathology of neuralgia?

The *cause* is unknown in most cases, although it is probable that we have to deal in many cases with an inflammatory affection of the nerve-tissue. It occurs more frequently in women past the middle age, in those of a neurotic tendency and in an anæmic condition. Exposure to cold, mechanical irritants, tumors, aneurisms, pressure on the bones, and wounds lead to neuralgia. Infectious diseases and various poisons and gout may also be causative.

What are the symptoms of neuralgia?

In some patients an attack of neuralgia is preceded by a chilly feeling and slight pains. When acute, there is a burning or violent tearing sensation in the course of the affected nerve, increased on exertion. The pain may cease for a time, to recur with renewed vigor. There is generally anæsthesia of the skin in the affected region, but occasionally we meet with hyperæsthesia, and along certain points the pain is always more intense (*points douloureux*). There are also vaso-motor symptoms in the form of pallor or congestion of the affected part. Various eruptions and changes in the color of the hair may also occur, and when the attacks are prolonged we have symptoms of interference with the general

nutrition. The attacks may recur at regular intervals or not return for a long time.

What is the treatment of neuralgia?

If dependent on anæmia or other general causes, we must try to cure the constitutional complaint. Nutritious food, tonics, etc. restore anæmic patients rapidly. In malarial, syphilitic, or gouty subjects we use the constitutional treatment. In mild cases we may use counter-irritants. Galvanic electricity seems to be very beneficial, especially the descending current, beginning with a mild current and gradually increasing its strength. Internally, quinine in large doses, arsenic, bromides, ergotine, aconite, potassium iodide, and phenacetin are recommended. In severe forms the use of opium cannot be dispensed with, but we must be very cautious in its use. External applications in the form of ointments or embrocations are of slight temporary benefit. In cases where no remedy seems to be of value a neurectomy—an excision of a part of the diseased nerve—may be necessary. Sometimes neurotomy—a section of the diseased nerve—or stretching of the nerve is practised. Baths are of benefit to some patients, especially in sciatic neuralgia.

NEURALGIA OF THE TRIGEMINUS.

What are the cause and symptomatology of trigeminal neuralgia?

A sudden chilling, cold, or malarial infection, affections of the teeth or cranium, constant strain of the optic nerve, may induce neuralgia of the fifth pair.

The attacks of intense pain along the course of the trigeminus may come on without any special cause or after an excitement of a physical or mental nature. The circulation becomes interfered with, and the face, at first pale, becomes red. Herpes may appear along the course of the nerve, while salivation or lachrymation are often prominent symptoms. According to the branch affected, we have (*a*) ophthalmic neuralgia, of a supraorbital or frontal nature, with pain on pressure along the course of the nerve; (*b*) supramaxillary, chiefly along the infraorbital nerve; and (*c*) inframaxillary, chiefly along the inferior dental nerve. The attacks may be very mild or very severe, and are sometimes sudden and epileptiform in character.

What are the diagnosis, prognosis, and treatment of trigeminal neuralgia?

Differentiate from periostitis or osteitis, migraine or toothache. Chronic cases are hard to cure, recent cases are quite amenable to *treatment*. Look always for the cause, and try to remove it. The application of electricity is beneficial. Internally, quinine, arsenic, gelsemium, aconite, opium, may be employed. In obstinate cases operative interference is advisable.

INTERCOSTAL NEURALGIA.

What is the etiology of intercostal neuralgia?

Affection of the vertebræ, ribs, the spinal cord, and aorta may be at first manifested by neuralgia of one or more of the intercostal nerves. But it may develop independently, and in anæmia after exposure to cold. It is more common on the left side, and occurs mostly in the nerves situated in from the fifth to the ninth intercostal space.

What are the symptoms and treatment of intercostal neuralgia?

The pain is usually very severe, especially on movement of the intercostal muscles. With the pain, as a rule, an herpetic eruption appears along the course of the affected nerve, which is supposed to be due to an extension of the inflammation from the nerve-ends to the skin. Pain on pressure is most marked near the vertebral, the sternal end, and the middle of the nerve. The affection is very obstinate, and may last long after the eruption has disappeared.

In recent cases we may use counter-irritants, and in the more chronic cases electricity and anodynes are indicated. For herpes a protecting ointment is sufficient.

MASTODYNIA, OR NEURALGIA OF THE MAMMARY GLAND.

This occurs in women at the time of puberty, and is a painful affection of the intercostal nerves supplying the mammary gland. Little is known about the affection, except that it is very obstinate and very difficult to treat. Applications of heat and electricity may be resorted to.

SCIATICA.

What is sciatica?

A neuralgic affection of the sciatic nerve, characterized chiefly by pain along the course of this nerve.

What are the etiology and pathology of sciatica?

It occurs frequently, and is more common in males than in females. It is most often observed between the ages of forty and fifty years. The gouty and those affected with muscular rheumatism are more liable to the disease. Muscular over-exertion, wet and cold, mechanical pressure from tumors, habitual constipation, and caries of the spine are all exciting causes. The sheath of the nerve is the part usually affected: it is swollen and red, and slight ecchymoses are noticed along its course. Sometimes the inflammation extends to the nerve itself.

What are the symptoms of sciatica, and their treatment?

If sudden in its development, the patient experiences a lightning-like pain shooting down from the sciatic notch, along the posterior surface of

the thigh and the outside of the leg to the foot. These paroxysms are repeated on the slightest exertion, but after a while they become constant and dull, worse at night. There is pain on pressure above the hip-joint, at the sciatic notch, the middle of the thigh, behind the knee, below the head of the fibula, behind the external malleolus, and on the dorsum of the foot. Abnormal sensations, anæsthesia, hyperæsthesia, and paræsthesia, are noticed along the course of the nerve. The muscles become slightly atrophied, and may give abnormal electrical reaction. Herpes zoster is sometimes observed along the course of the nerve. The affection may last a few weeks or be prolonged for years. It should be differentiated from psoas abscess, lumbago, locomotor ataxia, and nervous coxalgia. If dependent on some exciting cause, attempt to cure that. Absolute rest to the limb, heat, and counter-irritants, electricity (a strong descending current), and massage are generally of benefit. Internally, narcotics, mercury, lithia, may be given. Injections of cocaine or osmic acid are recommended. Nerve-stretching and cautery may be tried.

ARTICULAR NEUROSES.

What are articular neuroses?

Severe and painful diseases of one or more joints, without discoverable anatomical cause and due to affection of the nerves supplying these articulations.

What is the etiology of neuralgia of the joints?

The pains are not as paroxysmal as the ordinary neuralgic pains. We mostly meet these affections in the hysterical, especially young women, and they are often provoked by slight injuries, not serious enough to affect the joint itself.

What are the symptoms of neuroses of the joints?

Immediately after a slight accident or some time later the patient complains of a constant pain in one of the joints, which is increased on exertion or by mental excitement. Pressure or sudden jarring cannot be borne. Locomotion is painful, and the patient is unable or unwilling to move for weeks and months. The leg or arm is rigid, and either extended or flexed. The knee- and hip-joint are most often affected.

Diagnosis is rendered easy by the fact of absence of swelling and a general healthy appearance of the patient. If contracture is marked, examination under an anæsthetic is advisable.

What is the treatment of articular neuroses?

Electricity and massage, with cold douches, are of benefit. No local applications should be made. Try to treat the mental condition of the patient, and to induce daily attempts at walking. Tonics may be given if the patient is anæmic.

CEPHALALGIA.

What is cephalalgia?

Habitual headache, probably due to disturbances of circulation and nutrition.

What are the etiology and pathology of cephalalgia?

It is a very common affection, but little is known as to its *pathology* and *causes*. The irritation may be in the brain-substance, but is commonly supposed to be situated in the meninges. Strong as well as anæmic subjects are liable to the disease. After prolonged mental drain or physical exertion, headache is liable to follow. Rheumatism, the excessive use of tobacco or alcohol, chronic constipation, are predisposing causes. It sometimes appears to be idiopathic and also hereditary. It may last for months or a lifetime, occurring in repeated attacks.

What are the symptoms and treatment of cephalalgia?

The attacks of headache occur after mental emotion or physical exhaustion or without assignable cause. The pain is either general, all over the head, or limited to a certain area, being of a sharp, burning character as a rule. Nausea, vomiting, perspiration, general malaise, may accompany the pain. Occasionally there is hyperæsthesia of the skin along the seat of the headache.

Our *treatment* must necessarily depend on the cause of the affection. If syphilis, anæmia, or rheumatism cause it, we must remedy these maladies. For neurasthenics, electricity and cold water; for those mentally exhausted, rest, change of surroundings. Quinine, arsenic, bromides, coffee, and ergot are recommended; but there is no sure cure. Electricity and massage are of great benefit in many cases. If the pain is severe narcotics have to be resorted to. After cold, sod. salicylate will often relieve the headache. Lately antipyrine and phenacetin have come into use, with good success.

Other Forms of Neuralgia.

Neuralgias of the occipital, cervico-brachial, lumbar, genital, and rectal nerves are sometimes met with. Their *etiology*, *symptoms*, *course*, and *treatment* are the same as those of the other neuralgias.

THE REFLEXES, AND HOW TO TEST THEM.

What reflexes do we test for in nervous diseases?

For the cutaneous and tendon reflexes.

What are cutaneous reflexes?

Muscular action produced by irritation of the cutaneous nerves of sensation, not originating from central irritation. According to the manner in which reflexes are induced we get different results in different

parts of the body. By tickling, striking, or pricking the skin, or by applying cold to it, we may produce muscular movements in a corresponding part of the body. In some diseases (hysteria, hydrophobia, poisoning by some drugs) there is an abnormal increase in the reflex action, and the muscles of the whole body respond to an irritation of a part of the cutaneous surface. Two cutaneous reflexes are specially marked: the abdominal reflex, a contraction of the abdominal muscles by stroking the skin of the same side; and the cremasteric reflex, a drawing up of one or both testicles by stroking the skin on the inside of the thigh or of the scrotum. All these reflexes are abnormally increased or diminished in some nervous affections. Disease of the peripheral cutaneous nerves of the reflex centre of the spinal cord may produce diminution of reflex movement. Loss of power of inhibition, increase in irritability of the skin, may produce an increased muscular response to cutaneous irritation.

What are tendon reflexes?

Muscular action due to a mechanical excitement of the tendons and fascia. They are most marked in the lower extremity, where we have the "knee-jerk," or patellar reflex, a contraction of the quadriceps muscle, following a quick blow on the ligamentum patellæ while the leg hangs down passively; and the "ankle clonus," a violent tremor of the foot following a sudden flexion of the foot whereby the tendo Achillis is stretched. We also get muscular contraction occasionally by suddenly striking the periosteum of the bones of the lower extremities or the fascia. Normally, there are no tendon reflexes in the upper extremities, but under abnormal conditions we get muscular contractions by a blow on the respective tendons. Muscular contraction may also be produced in some nervous affections by a direct blow on the belly of a muscle.

How is electrical diagnosis made?

Both the faradic (induction) and the galvanic (constant) current may be used. One pole is applied to an indifferent point, while with the other *direct* excitement is produced by placing the pole on the muscle, or *indirect*, by placing it on the nerve, and thus acting on the muscle. In applying the galvanic battery one pole is positive (anode), the other negative (kathode). If the current is weak, there is no response; if stronger, on closing the current, while the kathode is on the muscle or the nerve, there is a slight contraction, but none on opening it. When the current is still stronger, the contraction on kathode closure is marked, and slight on anode closure or opening. Using the strongest current, tetanus is produced on kathode closure, and contraction on anode closure, anode opening, and kathode opening.

As an abbreviation the following terms will be used: Ka for kathode, An for anode, Cl for closure, O for opening, and C for contraction.

The electric excitability of the muscles may be increased in tetany, peripheral paralysis of recent origin, or diminished in bulbar paralysis, and progressive muscular atrophy. In some cases the *quality* of the electric

reaction becomes changed, and we have the so-called "reaction of degeneration." In progressive paralysis there is a progressive diminution in the power of the nerve to conduct either faradic or galvanic currents. The muscle does not respond to the faradic irritation, but weak galvanic currents will produce strong, protracted contractions, the Ka Cl C being as strong as the An Cl C, or the An Cl C may even be stronger than the Ka Cl C. This is known as "the reaction of degeneration." In protracted, incurable cases the electrical excitability soon diminishes or disappears, while in curable cases there is a gradual return to normal electric reaction. In some cases the reaction of degeneration is only partial.

THE DISTURBANCES OF MOTION.

PARALYSIS.

What is paralysis?

A loss of motor power in the voluntary muscles of the body. When this loss of power is complete, it is called paralysis; when incomplete, paresis. Disease affecting the cortical gray matter or the motor centres produces paralysis. The motor fibres take their beginning in the region of the central convolutions of the cerebrum and the paracentral lobule, and pass through the internal capsule, its posterior limb, the crusta, and pons. Then after decussation in the medulla they progress through the opposite half of the lateral column and part of the anterior columns of the spinal cord to the motor ganglia of the anterior cornua. Thence they emerge as the anterior spinal roots, and pass to their peripheral endings. The injury along the track of the motor nerves may be localized in a certain spot, thus producing paralysis of a limited portion of the body (monoplegia). But when the injury occurs in the internal capsule, where the motor-fibres are collected, the affection usually involves one-half of the body (hemiplegia), it being the side opposite to the injured spot in the capsule. In the medulla the fibres for both sides of the body lie together, and injury at this spot produces complete paralysis of both sides of the body (paraplegia). Lesions of the cord produce muscular paralysis of the parts supplied by the respective nerves emanating from the cord below the seat of lesion. Paralysis of an individual peripheral nerve is sometimes met with.

What is the etiology of paralysis?

It is customary to divide paralyses, according to their *cause*, into *anatomical*, with a known anatomical basis as to their causation, and into *functional*, in cases in which there is no discoverable anatomical lesion. Any definite cause impairing the conducting power of the motor tract may produce paralysis, as inflammation, disturbances of circulation, new growths within the nervous tract or in the surrounding tissues, traumatism, the influence of poisons like lead and arsenic, infectious diseases due

to poisoning from pathogenic products, inflammation of the nerve caused by exposure to cold. The causes of paralysis following attacks of hysteria, sudden emotion, disease of the sexual organs and of the intestines, cannot as yet be explained from anatomical lesions.

What are the symptoms of paralysis?

The patient complains of inability to perform certain motions. The affected sets of muscles after a while may or may not show atrophic changes. When there is no atrophy the lesion is usually between the cortex and the anterior cornua; when atrophy occurs, the lesion usually is situated in the ganglia of the anterior cornua or in the peripheral motor tract. In these cases with the atrophy of the muscles there is also a corresponding atrophy of the nerves ("degenerative atrophy"). The nerve-atrophy is demonstrated by changes in the normal electrical reaction. Passive motion may be easily performed, or resistance due to rigidity or shortening (contracture) of the muscles ("spastic paralysis") may be met with.

What are the different forms of paralysis met with?

(*a*) *Paralysis of the Ocular Muscles* may be due to affections of the peripheral or the central portion of the nerves. Direct injury, compression from tumors, thickened meninges, aneurism, exposure to cold, diabetes, acute diseases, locomotor ataxia, are among the causes producing it. The vision becomes double. If the oculo-motor nerve is affected, the upper eyelid droops, the pupil is dilated, the eye cannot move upward, downward, or inward. If the abducens is paralyzed, the eye does not move outward. If the trochlear nerve is paralyzed, rotation of the eyeball is impaired. With these symptoms there is often pain in the eye and in the supraorbital and frontal regions. The affection should be treated by means of weak electric currents, strychnine, and iodide of potash if of syphilitic origin.

(*b*) *Paralysis of the Muscles of Mastication* from an affection of the third branch of the trigeminus is of rare occurrence. If it is on one side, there is a difficulty in chewing; if on both, chewing is impossible. The jaw hangs down and cannot be moved. The cure of this affection depends on the primary cause.

(*c*) *Paralysis of the Facial Muscles*, or Bell's palsy, is of rather common occurrence, and is due to exposure to wet and cold, disease of the middle ear and the sphenoid bone, inflammation and enlargement of the parotid gland, tumors or inflammation within the brain or along the course of the nerve. The paralyzed half of the face is flat and without expression; the eyelids cannot be closely approximated, and tears are constantly trickling over the cheek; the corner of the mouth is drooping, and the saliva flows from it. On motion of the facial muscles the contraction of the sound side is more evident than usual. Speaking and chewing are difficult; the soft palate and uvula are sometimes relaxed and drawn to the unaffected side; the taste on the anterior two-thirds

of the tongue becomes dulled; the secretion of saliva is diminished; the hearing is abnormal. The affection, as a rule, begins suddenly, and in mild cases there is simply a loss of muscular power, but no change in the taste or the electric excitability of the muscles. In more pronounced cases the electric reaction is slightly changed, and anode closure contraction (An Cl C) is greater than kathode closure contraction (Ka Cl C). In the severe forms, with complete nerve and muscular degeneration, the electric excitability is lost, and after a time symptoms of motor irritation are noticed—tonic or spasmodic contractures and increased reflex excitability. The mild cases last two or three weeks, the severe forms from four to six weeks; the worst cases last for a long time, but may ultimately recover.

Prognosis always depends on the primary lesion, and is good when the electric excitability is not altered within a week or two. Electricity, at first galvanic, then faradic, may be employed. Hypodermic injection of strychnia, nerve-stretching, massage, have been also resorted to. Internally, iodide of potash is given.

(*d*) *Paralysis of the Muscles of the Upper Extremities.*—The following are the leading characteristics:

Paralysis of Trapezius: elevation of the shoulder is imperfect, the scapula becomes rotated, the general contour of the neck is changed, noticeable on deep inspiration.

Paralysis of Rhomboids: the edge of the scapula stands slightly outward, and there is some rotation of the scapula; when arm is raised, movement backward is weakened.

Paralysis of Serratus Magnus: the scapula is slightly rotated, and on moving the arm a deep furrow is noticed between the scapula and the vertebræ. Elevation of the arm above the shoulder level is difficult. It occurs often in men accustomed to lift heavy weights on their shoulder, and recovery is very slow.

Paralysis of the Deltoid: abduction of the arm is difficult; the patient is unable to elevate the arm. There is usually pain in the shoulder. The muscle soon begins to atrophy, and the head of the humerus falls away from the acromion.

Paralysis of Infraspinatus: outward rotation is lost, as well as in paralysis of teres minor.

Paralysis of Teres Major and Subscapularis: inward rotation is lost.

Paralysis of Latissimus Dorsi: adduction is impaired, and the humerus cannot be moved backward.

Paralysis of Pectoralis Major and Minor: adduction of upper arm is lost or diminished; the arm cannot be lowered against resistance.

Paralysis of Brachialis Anticus and Biceps: when in supination, flexion of the forearm is interfered with; when flexed, supination of forearm is lost.

Paralysis of Supinator Longus and Brevis: flexion is usually accompanied by supination, which is very feeble, and accomplished by other auxiliary muscles.

Paralysis of Pronator Teres and Quadratus: pronation of forearm is lost.

"Radial" Paralysis.—After compression, direct injury or cold, paralysis of muscles supplied by the musculo-spiral nerve may occur. When the triceps is paralyzed from the use of a crutch, etc. there is loss of extension in the forearm. When the extensors in the forearm are paralyzed, the hand hangs down, adduction and abduction are difficult, flexion of fingers is impaired, the thumb is flexed and adducted; flexion with the arm in position of pronation is difficult. Sensation is also impaired along the radial half of the back of hand and the fingers. In long-standing cases atrophy becomes pronounced.

Ulnar Paralysis often occurs in progressive muscular atrophy or after traumatism or from pressure. Flexion of the hand and lateral motion are altered; flexion of the fingers is imperfect; adduction and abduction of the fingers are impossible, as well as adduction of the thumb. The proximal phalanges are extended, and the terminal are flexed, giving the hand a claw-like appearance (*main en griffe*). Atrophy of the interossei is marked. Sensation is lost over the portion supplied by the ulnar cutaneous branches.

Median Paralysis mostly follows injury. Pronation of the forearm is lost; the terminal phalanges cannot be flexed; the thumb cannot be flexed or circumducted. There are often trophic disturbances and loss of cutaneous sensibility along the distribution of the nerve. The cases may be mild or very marked. Most of the traumatic cases are not amenable to treatment. The primary cause should be removed if possible. A constant galvanic current, alternated with faradic applications, is of great benefit. Electricity must be kept up for quite a long time. Baths and local massage are great aids to the treatment.

(*e*) *Paralysis of the Diaphragm* is but seldom met with, except in injury to the phrenic nerve or during attacks of hysteria. It may occur conjointly with other forms of paralysis in affections of the cord or cerebrum. The respiration is thoracic and very rapid; the abdomen does not change during inspiration or expiration. Bronchitis often develops, during which coughing is difficult. If dependent on hysteria, recovery will take place; in other cases it is doubtful. Faradization of the phrenic nerve is sometimes beneficial.

(*f*) *Paralysis of the Muscles of the Lower Extremity.*—Paralysis of Gluteus Maximus and Minimus: abduction of the thigh is difficult. Going uphill or rising from the sitting posture is difficult. Circumduction, rotation inward, and walking are impaired. The toes are turned outward.

Paralysis of Anterior Crural Nerve: flexion of the thigh and flexion of the trunk are impaired; the leg, when flexed, cannot be extended. Walking is difficult, standing is possible if the knee is extended. Rising from the kneeling position is impossible. The patella easily becomes dislocated.

Paralysis of Obturator Nerve: adduction of thigh and rotation outward are impaired. The patient finds it difficult to cross the legs.

Paralysis of Flexors of Knee: the knee cannot be bent, and locomotion is difficult. The leg is rotated either inward or outward, and the ligaments of the knee are unduly stretched.

Paralysis of Extensors of the Foot: extension of the ankle is impaired, walking is difficult, standing on tiptoe is impossible. The foot is everted, the ankle lowered, and talipes calcaneus results.

Paralysis of Peronei: the foot is inverted, the plantar arch is flattened.

Paralysis of Flexors of Foot: flexion, abduction, and adduction are impaired, and talipes varus soon develops.

The *treatment* of all these affections is the same as for paralysis of the upper extremity.

(*g*) *Toxic Paralyses.*—Lead paralysis occurs often in persons who have used articles prepared from lead. There is a primary degenerative atrophy of the nerve, followed by degeneration of the muscle, which are due to toxic action of lead upon the nerves or the spinal cord. The musculo-spiral nerve is the one usually affected. Extension of the first phalanx of the middle, ring, index, and little fingers becomes impaired. The extensors of the thumb and wrist become involved. In some cases the deltoid and the biceps are also affected. It occurs on both sides of the body, and the atrophy soon becomes marked. Sensation remains intact. On the gums, above the teeth, a characteristic blue "lead line" usually appears. Recovery occurs in most cases. Remove the cause, administer salines, iodide of potash. Electricity is of great value.

Ether, alcohol, copper, zinc, and arsenic may also produce paralysis, but these forms are of comparatively rare occurrence.

MUSCULAR SPASM.

What is muscular spasm?

A morbid movement of the muscles which is involuntary and due to motor irritation. The spasm may emanate from central irritation or may be due to peripheral reflex excitement.

What varieties of spasms do we meet with?

Spasms in general may be clonic (intermittent) or tonic (continuous). In epileptiform spasms the convulsions are clonic and extend over the whole body. In choreic spasms the movement of the muscles is either slight or very pronounced. In apoplexy we meet with rhythmical spasms of certain groups of muscles. Tremor (slight motions constantly following one another) is met with in a great many nervous diseases. A constant wave-like contraction of the small fibrillar muscular fibres is observed in progressive atrophy. Athetosis (a succession of various movements in the arms, head, but especially in the fingers and hand) is ob-

served in some nervous affections of children or adults. In cataleptic rigidity the muscles are no longer under the influence of the will, but assume any position given to them. If the tonic spasm affects the masseters, we call it trismus; if affecting the muscles of the back, bending the body backward, it is called opisthotonus; if attacking the whole body, it is tetanus.

Paradoxical muscular contraction is a slow tonic contraction caused by sudden approximation of the attachments of a muscle.

Enumerate the different spasms met with.

Spasm of the motor branch of the trigeminus: the masseters become very hard, the jaws are firmly brought together. This form of tonic spasm is called trismus, and may occur on one or both sides. Clonic spasm may be produced from reflex causes, and often lasts a long time. The affection should be treated by removing the cause, if it can be ascertained. Electricity is of great benefit. In tonic spasm we must often resort to artificial feeding. Narcotics may be used in severe cases.

Clonic facial spasm may be produced by peripheral or central causes. We notice short, rapid contractions in the muscles supplied by the facial nerve, either on one or on both sides of the face. These come on in repeated attacks or last continuously. Voluntary muscular action is not impaired. In some cases the spasm affects the eyelids only, and is either clonic (blepharospasm) or tonic. The spasm may last a few weeks or a whole lifetime. *Treatment* is difficult. Best results are obtained from the use of electricity, applied daily for five or ten minutes. Internally, bromides and arsenic are given. Application of the Paquelin cautery is sometimes of benefit.

Lingual spasms of a tonic or clonic nature may occur in hysteria or epilepsy, but rarely independently.

Spasms in the muscles of the neck may occur as a result of caries or nervous affection. The head is drawn forward, backward, or sideways according to the muscle affected. When the sterno-mastoid is affected and the head is drawn to one side, the condition is called torticollis. Most cases become chronic, and are not easily amenable to *treatment*, which consists of electricity, the cautery, nerve-stretching, and application of narcotics. Mechanical support gives good results in some cases.

Spasms of the muscles of the shoulder and the upper extremity may occur from reflex or central causes. Usually a whole group of muscles is affected; more often the forearm and the fingers than the arm. We treat these spasms in the same manner as all other spasms.

Spasms of the muscles of the lower extremity occur mostly in affections of the brain or cord. Tonic spasms (cramps) come on in the muscles of the calves of the legs after fatigue. When the reflexes are exaggerated, we sometimes notice a saltatory reflex spasm which consists of a violent movement of the leg following every attempt to touch the floor with the foot. It is mostly seen in hysterical persons.

Spasm of muscles of respiration is always rare. If tonic, the dia-

phragm becomes immobile and there is a severe pain in its region. The clonic form (singultus or hiccough) is not uncommon, which is sometimes very persistent, especially when the phrenic nerve is affected. Electricity and nervines are of benefit.

WRITER'S CRAMP (GRAPHOSPASM).

What is writer's cramp?

A disturbance of co-ordination in which the muscles of the hand, when to be applied to writing, are attacked by violent spasm, although the same muscles are able to perform their function when applied to any other ordinary action. It occurs in cases of excessive and long-continued application to writing.

What are the symptoms and treatment of graphospasm?

At every attempt at writing a spasm of the fingers occurs, making it impossible to hold the pen. In some the affection is of a clonic, tremulous nature, so that the words when written are very illegible. Sensation is normal, except slight numbness in the fingers and some pain in the affected muscles. A cure is very difficult, though many cases can recover when treated in time. Chorea and paralysis agitans sometimes also simulate graphospasm. Writing must be abandoned altogether. Mechanical appliances may help in the beginning. Change of surroundings, sea-baths, electricity, massage, and gymnastic exercises are of great value.

Similar cramps have also been noticed in piano- and violin-players, telegraphers, tailors; in the tongue in cornet-players; in the lower extremities in sewing-girls, ballet-dancers, professional athletes, etc.

NEURITIS AND ITS VARIETIES.

What is neuritis?

An inflammation of the nerves of an acute or chronic nature.

What are the etiology and pathology of neuritis?

Neuritis may be produced by injury to nerves, a violent muscular strain, exposure to cold, extension of inflammation from adjacent structures, general infectious diseases, rheumatism, syphilis, cancers, etc. In some cases it appears to be idiopathic.

In the acute form the vessels of the nerve become congested, exudation occurs, the nerve appears swollen and red. In severer cases the medullary sheaths and axis-cylinders of the nerve-fibres undergo destruction. These changes may take place along a considerable tract of the nerve or be limited to certain spots. The process of destruction may stop, and regeneration, partial or complete, may take place. The regeneration consists in the restoration of the axis-cylinder and in abundant formation of new connective tissue.

In the chronic form the destruction is progressive from the beginning, advancing in many cases from the periphery toward the centre.

What forms of neuritis do we meet with?

(1) Neuritis following traumatism and inflammation is chiefly characterized by pain of a violent nature along the course of the affected nerve, which is also sensitive to pressure. As a result of impaired nervous function anæsthesia and motor paralysis gradually develop, with subsequent muscular degeneration. The skin is œdematous, and an herpetic eruption is often noticed along the course of the nerve. Recovery is the rule in these cases if the primary exciting cause can be remedied. Sometimes an acute attack is followed by the chronic form.

(2) Multiple neuritis is a successive or simultaneous affection of one or more groups of nerves. It is comparatively rare with us, but more common in the East, where it is called "beri-beri." It is supposed to be due to the presence of some poison affecting the nerves. The affection usually begins suddenly with fever, loss of appetite, headache, and pains. The pains are most marked in the extremities along the larger nerves. The joints become swollen, the patient finds himself unable to move his legs very readily, and soon the paralysis extends to the upper extremities. The reflexes are diminished or absent, and the reaction of degeneration now becomes evident. The loss of muscular power produces a characteristic wrist- and foot-drop. The tingling first noticed in the skin becomes a troublesome hyperæsthesia. Trophic disturbances (œdema, loss of hair and nails) may also come on in the later stages of the disease. The bladder and rectum retain their normal functions. As soon as the paralytic affection extends to the muscles of respiration death speedily occurs. In some cases the affection, at first acute, soon becomes chronic, and after a time gradual recovery takes place or it goes on to a slow, fatal termination. It has been noticed that in these chronic cases tuberculosis often occurs as a complication. The affection should be differentiated from poliomyelitis. Recovery may take place even when the disease is very far advanced. During the acute stage salicylates seem to be of benefit. For the pain we use narcotics and hot applications. In chronic cases change of air, baths, and electricity are of great value.

(3) Alcoholic neuritis is a special variety of the chronic form of multiple neuritis, due to the toxic effect of alcohol on the peripheral nerves. This form is much more common in women than in men. It rarely begins acutely. There are usually prodromic symptoms consisting of vomiting, tingling, and pain in the extremities. The pain soon becomes severe, and inco-ordination of movements develops. The gait becomes staggering, the muscles give the reaction of degeneration, the reflexes are diminished or lost. The muscles soon atrophy, and anæsthesia over large areas becomes marked, though there may be tenderness on pressure. The affection is progressive as in multiple neuritis, unless the alcoholic habit is abandoned, in which case recovery usually takes place. The disease resembles greatly locomotor ataxia.

The *treatment* demands abstinence from alcohol, electricity, and the use of strychnine.

NEUROMA.

What is neuroma?

A morbid increase in the tissue-elements of the peripheral nerves.

What varieties of neuromata do we distinguish?

False and true neuroma. False neuromata consist of a morbid increase in the connective tissue of a nerve-sheath, while true neuromata consist of an increase in the numbers and size of the elements of a peripheral nerve. The true neuroma consists of medullated or non-medullated nerve-fibres imbedded in connective tissue. They may be hereditary or due to traumatism and amputation. The true neuromata are often multiple, and may give rise to no symptoms, or may cause a great deal of pain of an intermittent character, which is increased on pressure. When the conduction of the nerve-fibre is interfered with, anæsthesia and loss of power may develop. Reflex spasms of a tonic or clonic nature may also occur in the course of the disease. We sometimes are able to feel the little nodular growths, or when superficial we may see them. These nodules may be very sensitive or give no pain at all. The disease is very chronic in duration, but may eventually disappear.

The *diagnosis* is often difficult, except when the new growths are superficial.

Treatment consists in extirpation of the new growths. If too numerous, narcotics should be used for the alleviation of pain.

Fibromata, sarcomata, myomata, syphilitic and leprous gummata, are frequently called false neuromata, and any of these may give the same symptoms as the true neuroma.

VASO-MOTOR AND TROPHIC DISTURBANCES.

It is generally assumed that there are two sets of nerve-fibres surrounding the blood-vessels—the vaso-constrictors and vaso-dilators—but some deny the existence of the latter. The centre of the vaso-motor nerves is is in the cortex of the brain near the motor centre; thence the nerve-fibres proceed to the medulla, through the lateral columns and anterior roots, to the sympathetic system.

What varieties of vaso-motor disturbances do we meet with?

(1) Vaso-motor paralysis is characterized by an unnatural redness of certain parts of the skin, accompanied, as a rule, by a local elevation of temperature. This affection may accompany other neuroses or may occur independently from injury to the sympathetic nerves. The redness may be general or confined to one of the extremities.

(2) Vaso-motor spasm is characterized by unnatural pallor and coldness of the skin, accompanied by stiffness, and sometimes by pain. When of long duration gangrene of the affected parts may develop. This is sometimes observed as a reflex result in those having their hands constantly in water (washerwomen).

The existence of trophic centres is not proven. Some authors claim that trophic disturbances are due to vaso-motor irritation, but it is probable that there is a trophic centre, for in injury to the nerves often the skin becomes glossy or an abnormal amount of pigment is deposited. Atrophy of the muscles and the appearance of bed-sores are also referable to trophic disturbances. The nails in some nervous affections become dark and cracked, the hair is lost or turns white, and the trophic disturbance may even extend to the bones and joints. Associated with trophic disturbance we have disturbances of secretion in some neuroses. Sweating may be increased, diminished, absent, or unilateral. The salivary and other secretions may also be increased or diminished.

HEMICRANIA (MIGRAINE).

What is hemicrania?

A peculiar variety of unilateral headache, associated with vaso-motor disturbances.

What is the etiology of hemicrania?

It is more common in women than in men; it is often inherited, and may last from puberty to menopause or during the whole lifetime. Mental emotion, physical or mental fatigue, constipation, a faulty digestion, seem to act as exciting causes. Very little is known as to the direct cause and location of the affection, but it is most likely situated in the meninges, and is due to some vaso-motor disturbance.

What are the symptoms and treatment of hemicrania?

It comes on in distinct attacks, preceded usually by prodromata of vertigo, chills, malaise, uneasiness, etc. The pain when once beginning is continuous, mostly in the frontal, temporal, or parietal region, and is often of great intensity. The skin over the painful part is hyperæsthetic. There are loss of appetite, nausea, irritability, and bright spots before the eyes. The pain may be limited to one side (mostly the left). In the spastic form the affected side is pale, the skin is cool, the pupil is dilated, and the flow of saliva is increased. All these *symptoms* are dependent on irritation of the sympathetic. In the paralytic form the affected side is reddened, hot; the blood-vessels are dilated, the pupils are contracted. All these symptoms are due to paralysis of the sympathetic. Most attacks are not distinctly definable. They last a few hours or a day, and end with vomiting. The *prognosis* is not very good, as the attacks are apt to recur in spite of treatment, which in many cases is without effect. Narcotics act badly. Nitrite of amyl in the spastic form, ergotine in the paralytic form, are sometimes of benefit. Bromides, arsenic, cannabis, salicylates, guarana, nitro-glycerin, caffeine, are also used. Cold baths, electricity, massage, are of value.

PROGRESSIVE FACIAL HEMIATROPHY.

What is progressive facial hemiatrophy?

A progressive atrophy of the structures of one half of the face.

What is its etiology?

It is of rare occurrence, and belongs to early youth. It is slow in its progress, and has been noticed more in women than in men.

What are the symptoms of facial hemiatrophy?

It begins in a small spot on the cheek or the chin, where the normal color changes to white or to brown. From this point the discoloration spreads, and the affected part begins to have a sunken appearance. The skin, the bone, and the muscles all begin to atrophy on one half of the face, sometimes involving the tongue and soft palate on the same side. The sensibility is normal, but the hair is thinned on one side. Sometimes the atrophy spreads to the structures of the neck and shoulder. Occasionally only the skin and bones atrophy, while the muscles remain intact. The affection is probably due to some trophic change the nature of which has not yet been determined.

What are the prognosis and treatment of facial hemiatrophy?

The affection is progressive and incurable, though the patients may be benefited by applications of electricity. Occasionally a marked hypertrophy of one side of the face has been observed.

EXOPHTHALMIC GOITRE.

Syn.—Graves's disease; Basedow's disease.

What is exophthalmic goitre?

A group of symptoms consisting chiefly of a swelling of the thyroid gland, a quickening of the pulse, and a protrusion of the eyeballs from their orbits.

What is the etiology of exophthalmic goitre?

Little is known regarding its anatomical basis, but it is most likely due to a vaso-motor disturbance. It is often hereditary. Injuries in the nature of a concussion, mental emotions, pregnancy, and sexual disorders are among the exciting causes. It is more common in women who have reached maturity.

What is the pathology of exophthalmic goitre?

As yet no definite pathological lesion has been found to explain all the symptoms of exophthalmic goitre. It is claimed to be due to a disturbance or a paralysis situated in the sympathetic nervous system. It must be still looked upon as a general neurosis.

What are the symptoms, prognosis, and treatment of exophthalmic goitre?

The pulse becomes rapid (100–160), but varies at different times, and is usually rhythmic. The pulsation in the carotids is marked. The heart itself is often hypertrophied and dilated. The swelling of the thyroid gland (goitre) comes on gradually, and is either slight or very large. It is soft, and pulsations can be distinctly felt. The protrusion of the eyeballs is slight or may be sufficient to cause entire dislocation from their sockets, though the sight is not affected. Besides these chief *symptoms* there is usually a general muscular tremor of greater or lesser intensity, headache, sleeplessness, vertigo, anxiety, and irritability. Occasionally there are an elevation of temperature and sweating on one or both sides of the body. Pigmentation of the skin, gangrene of various parts, may occur. Anæmia, dyspnœa, digestive disturbances arise sooner or later. The disease lasts for years, and recovery is not common. Rest, change of surroundings, tonics, electricity, belladonna, ergotine are of benefit. Extirpation of the goitre is dangerous.

DISEASES OF THE SPINAL MEMBRANES.

ACUTE SPINAL MENINGITIS.

What is acute spinal meningitis?

An acute inflammation of the membranes of the spinal cord.

What are the etiology and pathology of acute spinal meningitis?

The inflammation may affect chiefly the dura mater or the pia mater or both. The inflammation is often secondary from extension of inflammation of the surrounding parts. It may complicate general infectious diseases, tuberculosis, septicæmia, and empyema. From caries an inflammation of the dura mater (pachymeningitis) often follows, while in general fevers it is the pia mater (leptomeningitis) that is usually attacked. If the dura mater is inflamed, it is red, thickened, and covered on its inner or outer surface with lymph or pus, and it may subsequently adhere to the bone. If the pia mater is inflamed, it appears congested and reddened, opaque and thick, and covered with lymph or pus. The space between the dura and pia mater may be filled with a purulent or semipurulent exudation.

What are the symptoms of acute spinal meningitis?

No matter where the inflammation is situated, the general clinical symptoms are the same. If there is a primary affection, the symptoms of this disease will often precede those of the spinal affection. There is pain in the back, nausea, followed by chills, fever, and an increase of the pain, which, when the nerve-trunks are compressed from exudation, may radiate toward the distribution of these nerves. The pain is constant, and

is increased on movement. The muscles of the back and neck become rigid, and may sometimes produce opisthotonos. The reflexes and sensations are increased. There may be retention of urine, constipation, headache, delirium, dyspnœa, and Cheyne-Stokes respiration. The paralysis is progressive; anæsthesia and the loss of reflexes are marked, and death may follow, but sometimes even severe cases recover, with or without the loss of muscular power.

What are the diagnosis and prognosis of acute spinal meningitis?

When the primary affection is severe, we may not be able to diagnose the spinal affection during life. Differentiation must be made from myelitis, meningeal hemorrhage, spinal hemorrhage, and rheumatism. The *prognosis* is very serious, especially in the severer forms of the affection and when the primary disease is dangerous to life.

What is the treatment of acute spinal meningitis?

Absolute rest, exclusion of sound and light, leeching and counter-irritation along the spine should be used. Hot baths may be given in the beginning. The use of mercury by inunction is of benefit. Sedatives are given for pain. If the paralysis is progressive, we must use electricity and massage.

CHRONIC SPINAL MENINGITIS.

What is chronic spinal meningitis?

A chronic inflammation of the spinal membranes.

What are the etiology and pathology of chronic spinal meningitis?

It hardly ever occurs as a primary affection. Secondarily, it follows acute attacks, epidemics, diseases of the cord and vertebræ of a chronic nature, concussion, traumatism, alcoholism, syphilis, and tuberculosis. The membrane is thickened and opaque; the spinal fluid is increased in quantity. The nerve-roots are swollen, and afterward from compression they may undergo atrophy. Sometimes the inflammation extends to the cord itself, causing softening and disintegration.

What are the symptoms of chronic spinal meningitis?

The symptoms correspond to those of the acute form, being less in intensity. There are pains in the back, mostly of a dull nature: the stiffness in the muscles is not so marked as in the acute form of the disease. The pains along the distribution of the nerves may be severe; hyperæsthesia and abnormal sensations, followed by anæsthesia, are frequently present. The pain persists for weeks or months, the muscles atrophy, and the reflexes and sensation are completely lost. If the cord is compressed, the parts supplied by the affected nerves are paralyzed.

What are the diagnosis and prognosis?

We must differentiate from rheumatism, neuritis, progressive muscular atrophy, locomotor ataxia, and spinal caries.

Prognosis is best in cases following injury or syphilis, but in all cases it depends on the extent of the inflammation and its location.

What is the treatment?

Absolute rest, a comfortable posture, and counter-irritants to the spine are essential. For the pain we give sedatives. Iodide of potassium and mercury are given internally where the disease is suspected to be of syphilitic origin. Tepid or cold baths, electricity, and massage in the later stages may be used.

PACHYMENINGITIS CERVICALIS HYPERTROPHICA.

What is hypertrophic pachymeningitis?

A chronic thickening of the dura mater, nearly always in the cervical portion of the spinal cord.

What are its etiology and pathology?

The *etiology* is obscure: it may follow cold and excessive use of alcohol. The dura mater becomes very thick from a new growth of connective tissue, and the cord and nerve-roots become compressed, causing degeneration of nerve and muscles.

What are its symptoms?

There is severe pain in the cervical region, shooting down the arms. The fingers feel numb. This condition may last a few months, and is followed by paralysis, accompanied by atrophy of the upper extremities, chiefly noticed along the distribution of the ulnar or median nerve. The hand becomes extended from contracture of the extensors. As the compression of the cord advances there arises a spastic paralysis of the lower extremities, not accompanied by atrophy.

What are the prognosis, diagnosis, and treatment?

Recovery may take place, though most cases gradually advance to a fatal termination. We must differentiate from tumors in the cord, lateral sclerosis, and caries of cervical vertebræ.

The *treatment* is symptomatic: electricity, iodide of potash, and the Paquelin cautery are also of benefit.

MENINGEAL APOPLEXY.

What is meningeal apoplexy?

A hemorrhage of large or small extent into and between the membranes of the spinal cord.

What are the etiology and pathology of meningeal apoplexy?

It may occur at all ages. Injury, great physical exertion, severe convulsions, diseases of the vertebræ, meningitis, infectious and septic fevers, and aneurism may produce it. Extradural hemorrhage is slight in extent, and collects on the posterior surface. It mostly occurs in the cervical region. Intrameningeal hemorrhage sometimes fills up the whole space between the cord and the dura mater, causing compression of the cord.

What are the symptoms of meningeal apoplexy?

They begin suddenly, but cause no loss of consciousness. When the hemorrhage is of slight extent the symptoms are not marked, but when the hemorrhage is more or less extensive we have symptoms of irritation in the sensory and motor branches of the corresponding parts, as follows: severe pain, neuralgia in the extremities, muscular tremor, and contractures. If the hemorrhage is extensive, symptoms of muscular paralysis and disturbance of the bladder function may appear. An affection called pachymeningitis interna hæmorrhagica is sometimes met with, consisting of an encapsulated collection of blood on the inner surface of the dura mater, and occurring in the chronic insane and alcoholics.

What are the prognosis, diagnosis, and treatment of meningeal apoplexy?

The *prognosis* is favorable when the blood is rapidly absorbed. *Diagnosis* can rarely be made with certainty. We treat by employing absolute rest, local applications of ice, and bloodletting. In chronic cases electricity, baths, and iodide of potassium may be used.

DISEASES OF THE SPINAL CORD.

DISTURBANCES OF CIRCULATION.

What disturbances of circulation in the cord are met with?

Anæmia, a temporary or permanent diminution in the blood-supply; and hyperæmia, a temporary or permanent increase in the blood-supply.

What are the symptoms of anæmia?

It usually is caused by a general narrowing of the arteries, as in chronic meningitis. If the diminution in blood-supply is permanent, paralysis necessarily follows. If the anæmia is transient (from arterial spasm), tetanoid symptoms often develop, as also the so-called "intermitting lameness." If the anæmia of the cord is part of a general anæmia, the spinal symptoms are not pronounced. There are dull pain and fatigue on slight exertion, and weakness which may increase to paralysis. Paraplegia may also result from anæmia, caused by excessive loss of blood.

Attention to the general health is most important in the *treatment* of these cases.

What are the symptoms of hyperæmia?

Mechanical congestion may result from lying on the back. Active congestion may complicate many diseases, and may follow tetanus, strychnine-poisoning, general disturbance of circulation, and coitus. The *symptoms* are obscure, and cannot be diagnosed during life, except when so active as to cause inflammation.

SPINAL APOPLEXY.

What is spinal apoplexy?

A hemorrhage into the substance of the spinal cord of a primary or secondary nature.

What are the etiology and pathology of spinal apoplexy?

Primary hemorrhage is rare, except after traumatism. Secondary hemorrhage may complicate myelitis, chronic alcoholism, sexual excess, tumors of the cord, and epidemic meningitis. The extravasation may be slight or severe. When large the substance of the cord is destroyed in the direction of the long axis.

What are the symptoms of spinal apoplexy?

Most cases begin suddenly, though occasionally there are prodromata, as disturbances of sensation. When the hemorrhage is extensive, there is a rapid development of paralysis, most marked in the lower extremities. There is also great pain in the back, paralysis of the bladder, anæsthesia, and change of reflexes—symptoms the occurrence of which will depend on the location of the hemorrhage. If the blood is absorbed, the paralytic symptoms gradually disappear, but often the symptoms persist and death ensues.

What are the diagnosis, prognosis, and treatment of spinal apoplexy?

We must differentiate from multiple neuritis, hemorrhagic myelitis, and meningeal hemorrhage. The danger to life is always great, but the *prognosis* is better when the hemorrhage is in the dorsal region.

The *treatment* consists of absolute rest, ice to the spine, laxatives, and ergot. The paralysis is treated according to general principles.

FUNCTIONAL DISTURBANCES OF THE SPINAL CORD.

What are functional disturbances of the spinal cord?

A set of symptoms resembling severe spinal disease, but having no known anatomical basis.

What is the etiology of functional disturbances of the spinal cord?

It is not known whether disturbance of the sensory tract or of the circulation is the basis of these troubles. Severe emotional excitement, mental exertion, excessive use of tobacco or alcohol, and onanism are

among the exciting causes. Hypochondriasis also may lead to functional disturbances.

What are the symptoms?

They are slow in their onset, beginning with fatigue and weakness, pain in the back of a more or less severe character, numbness in the extremities, sexual disturbances, and a number of general symptoms, due to the neurasthenic condition of the patient. There may be tenderness along the vertebræ. The reflexes and sensations are usually normal, but there may be coldness, sweating, and chilly feelings. The appetite is good as a rule.

What are the diagnosis, prognosis, and treatment?

It is sometimes difficult to diagnose the affection from serious spinal disease except by thorough physical examination. Permanent recovery may ensue, but in some cases the affection, though never dangerous, continues all through life.

Moral treatment is of chief importance. Proper diet, good exercise, electricity, cold baths, and tonics are of great benefit.

TRAUMATISM OF THE SPINAL CORD.

This is a lesion of the spinal cord due to mechanical injury.

What is the pathology of traumatic lesion?

The extent of injury varies greatly according to the cause. There is usually hemorrhage, either outside or on the inner surface of the dura mater or the pia mater or into the cord itself, and with more or less laceration of the cord tissue. As a result of the effusion the cord usually softens; the nerve-fibres waste away and degenerate in an ascending or descending manner.

What are the symptoms of traumatism of the spinal cord?

The *symptoms* differ according to the seat of injury. There are usually marked motor and sensory disturbances, and occasionally sudden, complete paralysis of the upper or lower extremities. The bladder and rectum may be abnormal in their functions. There are pains and abnormal sensations. The temperature is often increased, the reflexes are diminished. When the damage to the spinal cord is extensive death ensues sooner or later. The symptoms in some cases are very slight in the beginning, but increase in severity within a few days, or there may be a sudden increase in them a few months subsequently. In other cases the symptoms, at first marked, gradually abate, which is due to the absorption of the blood-clot.

What are the prognosis and treatment of spinal traumatism?

If the symptoms are slight we may expect a recovery, but we must always be cautious in our *diagnosis* of the extent of the lesion.

The *treatment* is more surgical in the beginning. Absolute rest, application of ice; trephining may be necessary. When paralytic symptoms develop we treat them accordingly.

CONCUSSION OF THE SPINE.

What is concussion of the spine?

A severe jarring of the body, followed by a group of spinal symptoms supposed to be due to some minute changes in the cord of an unknown nature.

What is the etiology of concussion of the spine?

Severe concussions may result from railway accidents ("railway spine") or violent bending of the body, fall from a horse, blow on the back, high jumping, etc.

What are the symptoms of concussion of the spine?

In some cases the onset of the *symptoms* is sudden, due to a jarring of the brain as well as of the spinal cord—loss of consciousness, complete paralysis, small pulse, collapse, and within a few hours death. In others the severe symptoms are followed by gradual improvement, but it often takes years till the recovery is complete. There is a difficulty in locomotion, weakness in the upper extremities, but the electric reaction is normal; there are pain of varying degree and tenderness on pressure along the spine. Sometimes sensation is diminished as well as the reflexes. Cerebral symptoms, like headache, dizziness, fainting, etc., may be present or absent. Anomalies in the action of the bladder, rectum, and sexual organs may or may not occur. These symptoms may last for months or years. In other cases there are no special symptoms after the concussion, but within a few weeks or months there is a gradual development of spinal symptoms, combined with bulbar symptoms and cerebral disturbances. These cases gradually get worse, although recovery may take place.

What are the diagnosis and treatment of concussion of the spine?

We must be careful in differentiating concussion from neurasthenia or hysteria.

In the *treatment* we advise rest, stimulants, electricity to counteract the shock to the system. In chronic cases electricity, potass. iodide, ergot, and strychnine, baths, change of climate best.

CAISSON DISEASE.

What is caisson disease?

An affection occurring in divers, in bridge-builders, and in all those working under water at a great depth. The symptoms develop on coming to the surface suddenly, where the atmospheric pressure is greatly

lessened. The affection is supposed to be due to the presence of gases in the blood, escaping thence into the nerve-structures, and causing an arrest of nervous function from pressure.

What are the symptoms of "caisson disease"?

The *symptoms* usually occur on return to the surface of the water or a short time after. There are pains in the ears and joints, bleeding from the nose. The pulse is slow and strong; vomiting often occurs. There is a disturbance of motor and sensory functions. Paraplegia or hemiplegia may occur, usually beginning suddenly. Sensation may also be lost. In some cases recovery takes place within a few weeks; in others a fatal termination rapidly ensues. Occasionally cerebral symptoms, like loss of consciousness, coma, and irregular breathing, have been noticed. Retention of urine, partial or complete, generally exists.

What is the treatment of "caisson disease"?

As a prevention we should advise persons engaged in work under water to change gradually from a great depth to the surface, and not come up all at once. When the disease is once developed, it should be treated in the same way as an acute myelitis, which it resembles in its symptoms.

PRESSURE MYELITIS.

What is pressure myelitis?

An inflammation of the spinal cord, due to compression of the cord from the presence of new growths and diseases of the vertebræ.

What are the etiology and pathology of pressure myelitis?

Accumulation of masses of inflammatory products within the membranes, chronic caries in tubercular and other disease, new growths, aneurism, and cancer of the vertebræ may by compression of the cord produce paralysis of the parts below the seat of affection. It occurs in children as well as in adults. In tubercular caries of the vertebræ, having its seat most commonly in the dorsal portion, several vertebræ become diseased, and, being rendered softer, the healthy vertebræ compress them, and, pushing them toward the cord, the spinal canal is narrowed. From encroachment of the vertebræ the cord is compressed. The cord at this point is considerably narrowed and softened, of a flat, cylindrical, or indented appearance. The nerve-fibres are not destroyed, though their power of conduction is interfered with from pressure. In some cases we find very little evidence of inflammation in the cord itself, though sometimes there is a disintegration of the axis-cylinders and the neuroglia and an increase in new connective tissue, while in other cases the symptoms of inflammation are very marked. In chronic cases the degeneration extends in an ascending or descending manner.

What are the symptoms of pressure myelitis?

The *symptoms* depend on the degree of compression, its duration,

and the amount of degeneration produced. In some cases caries may be present for a long time without ever involving the spinal cord. In other cases we first have the signs of the presence of a caries of the vertebræ, followed by slowly or quickly developing spinal symptoms. In these cases there is pain in the affected part of the spine, increased on exertion, and there is also pain shooting along the course of the compressed nerves. The pains are of a neuralgic character, and are constant or intermittent. There is hyperæsthesia, and later anæsthesia. The muscles become weak and atrophy; the paresis increases, going on to paralysis if the affection is progressive. As to the reflexes, when the compression is above the reflex arc for the lower extremities, the tendon reflexes are greatly increased, as the inhibitory influences do not reach the reflex arc; the cutaneous reflexes are not so markedly increased, and are often even diminished. There are sometimes trophic and circulatory disturbances. In severe cases the functions of the bladder and the rectum are interfered with.

What are the prognosis and diagnosis of pressure myelitis?

In tumors (cancer, etc.) the *prognosis* is always bad. In caries recovery may take place, even in cases seemingly severe and hopeless, except when some complicating disease arises. We must differentiate this affection from subacute transverse myelitis, new growths within the cord, and extensive pachymeningitis.

What is the treatment of pressure myelitis?

If it is due to spondylitis, we must treat that affection in the proper manner. Rest in bed, cupping, and counter-irritation of the spinal column, especially the Paquelin cautery, electricity, the internal use of iodine, are all recommended. As to the other symptoms, we treat those as we do ordinary myelitis. Orthopædic appliances are often followed by great benefit in suitable cases.

MYELITIS.

What is myelitis?

An inflammation of the spinal cord.

What are the varieties of myelitis?

If divided according to the mode of onset, we distinguish acute, subacute, and chronic myelitis. If divided according to the distribution, we have diffuse, transverse, disseminated, central, parenchymatous, and interstitial myelitis. We shall divide the affection into acute and chronic myelitis.

What is the etiology of acute and chronic myelitis?

The *etiology* is obscure. It is more common in males than in females, and heredity seems to have some influence. As exciting causes we have exposure to cold, great physical or mental strain, sexual excess, injuries,

concussion of the spine, hemorrhage into the cord, acute infectious diseases, syphilis, purulent inflammation of neighboring organs, sudden arrest of menses, lifting of heavy weights, alcoholism, and hydrophobia.

What is the pathology of myelitis?

The cord in a certain spot is soft and flexible, the white matter is reddish in color, the gray matter is indistinct. On microscopical examination the nerve-tissue is found to be almost entirely destroyed, the axis-cylinders are swollen, the ganglion-cells show evidences of destruction. There is a marked increase in connective tissue, causing a great hardness in the affected part of the cord in long-standing cases. There are fatty cells and flat "spider cells" in great number between the meshes of neuroglia. The blood-vessels are dilated and thickened. Hemorrhages are noticed in various places. The seat of the affection is mostly in the dorsal portion of the cord. It usually extends in a transverse manner, and then upward and downward from the main focus. A complete softening and breaking down of nerve-tissue in the cord is very rarely met with.

What are the symptoms of myelitis?

The *symptoms* differ greatly according to the seat and extent of the inflammation. They depend on interference with the function of the cord, and in the acute form may be accompanied by general symptoms of all acute inflammations—malaise, headache, fever, and loss of appetite. The motor symptoms are first to appear, though they may be preceded by tingling and burning sensations. There is a slight weakness in one or both legs, increasing even to complete paralysis, due to interruption of conduction in the lateral or crossed pyramidal tract, where the fibres of voluntary motion are situated. If situated in the dorsal or lumbar part of the cord, the upper extremities remain free. If situated in the cervical region, paralysis of the upper extremity and respiratory muscles may occur. Associated with the motor *paralyses* there are also symptoms of motor *irritation*—spasmodic twitchings, painful cramps, ataxia, and sometimes convulsions. Sensation is impaired, but as a rule this occurs later on in the disease. At first there are symptoms of sensory irritation—numbness, pricking, formication. In chronic cases the sensation is diminished, but frequently it is entirely lost; occasionally hyperæsthesia has been observed. When the sensation is impaired the posterior columns, especially the posterior cornua of gray matter, are involved. The myelitis is about on a level with the line of disturbed sensation. The reflexes are diminished, normal, or increased according to the position of the lesion. If the fibres above the reflex arc are irritated, the reflexes are diminished, but if destroyed, the reflexes are increased, as the power of inhibition from above is not transmitted. The posterior column and anterior cornua of gray matter seem to be the seat of reflex conduction. In dorsal and cervical myelitis the reflexes are increased, while in lumbar myelitis they are diminished or

destroyed in the lower extremities. Micturition is difficult and painful from the beginning, and there may be complete retention of urine. Later on, from paralysis of the sphincter of the bladder, incontinence may occur. Cystitis is very apt to complicate retention. These bladder symptoms may complicate myelitis in any part of the cord, but mostly in affection of the posterior columns. At first there is constipation from diminution in the peristaltic movements of the intestines or from paresis of the abdominal muscles. Later the sphincter ani becomes paralyzed, and the fæces are involuntarily passed. The sexual functions are also diminished or lost. The trophic disturbances consist of atrophy of the affected muscles, with or without degeneration, dry skin, and brittle nails; vaso-motor disturbances are also noticed. If degeneration takes place, the lesion is situated in the anterior gray cornua or anterior roots. There is often an increase in the temperature of the affected part in the beginning, but when the paralysis is complete it may fall to subnormal. There may be an optic neuritis if the cervical portion of the cord is affected. Bed-sores occur in the later stages of the disease. Most cases are chronic in their course, lasting one or more years. Improvement and remissions occur, but recovery is rare.

What are the diagnosis and treatment of myelitis?

We must differentiate it from compression of the cord, new growths, and sclerosis. If we can find an exciting cause, we should try to remedy that at once. If due to cold, a hot bath is of great benefit. If due to syphilis, antisyphilitic treatment should be employed, and in doubtful cases always resort to mercurial inunctions. The constant electric current, if not too strong, is of benefit. The galvanic may be alternated with the faradic current. Baths are of great service. If taken at home, the baths should be moderately warm, daily repeated, and followed by rubbing. If the patient is in better circumstances, mud-baths or cold-water institutions may be tried. In recent cases dry or wet cupping along the spine, counter-irritants, hot-water bags, may be tried. Internally, ergot and strychnine have been used, but with little success. Mental and bodily rest, nutritious diet, and an easy posture are advisable, In cases of retention of urine we employ the catheter. If the pain is severe, narcotics must be resorted to. The skin should be kept absolutely clean. Nitrate of silver internally has sometimes given good results. Tonics should be employed in anæmic patients.

DISSEMINATED SCLEROSIS.

What is disseminated sclerosis?

A chronic affection of the spinal cord and brain, due to a dissemination of sclerotic patches in various parts of the central nervous system.

What are the etiology and pathology of disseminated sclerosis?

Very little is known as to its etiology. Heredity, syphilis, mental or

physical over-exertion, may have an influence on the development of the sclerotic nodules. There are small gray nodules distributed all over the cord and brain, chiefly in the white substance. Each patch consists of connective tissue, with very few nerve-cells and a number of fat-cells. There is hardly ever any secondary destruction in the cord itself.

What are the symptoms of disseminated sclerosis?

According to the location of the patches the *symptoms* differ. The most constant symptom is a tremor resembling that of paralysis agitans, but in sclerosis, tremor occurs only with intentional movement, and is not regular in character, and is more marked in the upper extremities than in the lower. There are also a disturbance of speech and slight twitchings of the eyeball (nystagmus). Paresis does not occur until late in the disease. The tendon reflexes are greatly increased, especially in the lower extremities. The gait is usually dragging (spastic-paretic). Sensation and cutaneous reflexes remain quite normal. Associated with the spinal symptoms there are also cerebral symptoms—mental weakness, dementia, melancholia, apoplectic attacks, vertigo, and epilepsy. Trophic disturbances and affections of the bladder and rectum are unusual. The affection is very chronic in its course, lasting for years and ending in death. The above set of symptoms is not the exact type of disseminated sclerosis, as there are a good many varieties resembling any of the affections of the spinal cord. *Diagnosis* is sometimes difficult.

What are the prognosis and treatment of disseminated sclerosis?

Prognosis is unfavorable. The *treatment* is that of chronic myelitis.

LOCOMOTOR ATAXIA (TABES DORSALIS).

What is locomotor ataxia?

A disease characterized by a gray degeneration of the posterior columns of the spinal cord.

What is the etiology of locomotor ataxia?

Heredity is not a permanent factor in its production. Syphilis is one of the most common causes, and is said to be the only cause, according to the view of some observers. Poisoning by ergot gives symptoms similar to locomotor ataxia. It is more common in men than in women (10 : 1), mostly in those of middle age. But it is sometimes met with in children, the victims of hereditary syphilis.

What is the pathology of locomotor ataxia?

The pia mater is thickened, the posterior columns have a gray, translucent appearance, and are atrophied; the posterior cornua of gray matter and the posterior nerve-roots are atrophied. Under the microscope we can see that the nerve-fibres in the posterior columns have disappeared, and are replaced by new connective tissue. The degeneration is most

marked in the lumbar portion of the cord, affecting there the middle and posterior portions of the posterior columns; in the dorsal portions the whole of the posterior columns is usually affected; while in the cervical portion mostly the columns of Goll degenerate. The degeneration is usually symmetrical in the two halves of the cord. The gray color is due to the disappearance of medullary sheaths.

What are the symptoms of locomotor ataxia?

The *symptoms* show the same regularity in their appearance in all cases, making the diagnosis of this affection comparatively easy. The *prodromata* consist of lightning-like pains in the lower extremities, numbness in the fingers, a sensation of constriction around the chest, and headache. These symptoms may constitute the only evidence of locomotor ataxia, and last for years; but sooner or later there are added absence of patellar reflex and an immobility of the pupil. The absence of patellar reflex (Westphal symptom) is always observed, and is due to a degeneration of the centripetal portion of the reflex arc in the middle portion of the posterior column of the spinal cord. The immobility of the pupil (Argyll-Robertson symptom) consists of immobility of the pupil to light, while accommodation of the pupil is retained, as can be proved by testing for distance of objects. As a rule, the pupils are contracted. There may also be a paralysis of the ocular muscles, either on one or on both sides, coming on rather suddenly and dependent on degeneration of the respective nerves. In some cases there is also an optic atrophy, which may begin quite early in the disease, ending with total blindness. There may also be a slight loss of cutaneous sensation. All these symptoms may last for several months or years.

The *second* or *ataxic stage* commences with disturbances of mobility. The disturbance of co-ordination (ataxia) is very marked, especially in the lower extremities. The gait becomes difficult and uncertain; there is difficulty in rising or rapid turning. The patient feels as if he were walking on coal, and on closing the eyes the body begins to sway (Romberg's symptom), especially when the feet are put together, which symptoms are due to a defect in controlling the muscles from impairment of sensation. Walking soon becomes very difficult, and ataxia may appear in the upper extremities also.

The definite *cause* of ataxia has not yet been ascertained, but it is probably due to a lesion of the gray matter. The power of the muscles is usually preserved in locomotor ataxia. The electric excitement of the muscles and nerves remains normal, but the muscles soon become flabby from disuse. Sensation is changed from the beginning, and the lancinating pains are marked in all cases and come on in paroxysms. The pains are mostly in the legs, but also occur in the arms and head, the loins, the back, and the trunk. Herpes accompanies these neuralgic pains sometimes. But soon anæsthesia develops. At first the tactile sense is interfered with; then the senses of pressure and temperature are diminished or lost. The muscular sense is greatly interfered with, especially when the

controlling power of the eyes is temporarily taken away. Occasionally we meet with delayed sensations, as is proved when the prick of a pin is only felt a few seconds after being applied. The cutaneous reflexes are normal in most cases. Difficulty in micturition is nearly always present, and cystitis may develop. In advanced cases there is incontinence of urine. Constipation is the rule, and is often marked. The sexual functions are diminished or abolished. This stage may last for many years, and may show a standstill, but it is usually progressive and advances to the third stage.

The *third* or *last stage* is marked by a gradual change to the worse, and the patient is unable to leave his bed. Paresis, and even paralysis, may occur from extension of degeneration to the lateral pyramidal tracts of the cord. Anæsthesia of the lower, and sometimes of the upper, extremities becomes marked. The joints (mostly the knee- and hip-joints) show on both sides of the body a painless swelling, from the presence of great quantities of serum. Spontaneous dislocation and fracture occur. Other trophic disturbances are rare, except bed-sores and peculiar perforating ulcers of the sole of the foot. Death usually occurs from exhaustion.

There are often complications in other organs. There may be attacks of sharp pain, called "crises," coming on suddenly, in paroxysms. "Gastric crises" consist of violent pain in the stomach, vomiting, and vertigo, lasting a variable time. "Intestinal crises" consist of a very painful diarrhœa. "Laryngeal crises" are severe attacks of dyspnœa, due to a spasm of the glottis and associated with a severe paroxysmal cough. "Renal crises" resemble attacks of renal colic. There are also rectal, urethral, and testicular crises, characterized by acute pain in the regions mentioned. Cerebral symptoms are sometimes met with in the last stage of the disease, as dementia and delusions. Occasionally the sense of hearing is lost from degeneration of the auditory nerve.

What are the prognosis and diagnosis of locomotor ataxia?

The affection is usually fatal, though it may last for a great many years. The different cases show a difference with regard to their progress, although the characteristic symptoms are present in all with a varying degree of intensity. The *diagnosis* of locomotor ataxia is somewhat difficult in the beginning, but comparatively easy when the characteristic symptoms appear. In persistent "rheumatic pains," ocular disturbances, and gastric attacks we should always examine the reflexes. Vertebral caries compressing the cord, tumors of the cord, multiple sclerosis, alcoholic or tobacco neuritis, may simulate locomotor ataxia.

What is the treatment of locomotor ataxia?

Any cause that may hasten the production of the disease should be removed, such as mental or physical exhaustion, exposure to cold, alcoholic excess, smoking. In most cases an antisyphilitic treatment should be begun at once—iodide of potash, mercurial inunctions, com-

bined with tonics and good food. In addition, arsenic, strychnia, nitrate of silver, belladonna, ergot, and phosphorus are recommended. The ascending electrical current, vapor-baths, cold baths, mud- and iron-baths are valuable adjuvants to internal treatment. Counter-irritation may be employed along the spine. Lately nerve-stretching and stretching of the spinal cord by means of an extension or suspension apparatus have been used with benefit in many cases. For the pain and the crises we use narcotics, antipyrine, bromides, etc. The other symptoms are treated according to general rules.

AMYOTROPHIC LATERAL SCLEROSIS.

What is amyotrophic lateral sclerosis?

A degeneration of the whole pyramidal tract of the spinal cord, combined with atrophy of certain nerve-centres in the medulla.

What are the etiology of amyotrophic lateral sclerosis, and its pathology?

The *etiology* is very obscure. Exposure to wet and cold and great physical exertion are supposed to act as exciting causes. It has been more common among females between twenty-five and fifty years of age than among males. Both pyramidal tracts are symmetrically sclerosed, as well as the large cells in the anterior gray cornua. Sometimes the degeneration extends as far as the internal capsule. Certain nerve-centres (the hypoglossus and vagus accessory) in the medulla also degenerate, the process also extending to the periphery. The muscles greatly atrophy, and sometimes wholly disappear.

What are the symptoms of amyotrophic lateral sclerosis?

The affection usually manifests itself in the arm at first. There is an increasing weakness in one arm, which after a time extends to the other. The muscles become markedly atrophied, especially on the extensor side. The atrophy is not limited to one group of muscles, but seems to occur *en masse*. The power to move the arm is soon totally lost. Electric reaction is normal in the intact muscular fibres, but reaction of degeneration is noticed when the atrophy is extreme. The arm shows a characteristic paralytic deformity: it lies close to the body, the forearm is semiflexed and pronated, the hand is semiflexed, and the fingers are bent upon the palm. The affected muscles are in a marked state of contracture. Sensation is normal, but the tendon reflexes are greatly increased. The atrophy and contracture afterward extend to the lower extremities; the gait becomes spastic and paretic, but soon paralysis supervenes. The speech becomes indistinct, swallowing is difficult, the tongue becomes atrophied, and general nutrition suffers. Death finally ensues from difficulty in respiration. The bladder and rectum usually retain their normal functions.

What are the diagnosis, prognosis, and treatment of amyotrophic lateral sclerosis?

Myelitis, tumors in the spinal cord, may for a time simulate this affection, but the *course* is, as a rule, a typical one.

The *prognosis* is bad, the disease being fatal within a few years.

The *treatment* should be symptomatic.

PROGRESSIVE MUSCULAR ATROPHY OF SPINAL ORIGIN.

What is progressive muscular atrophy?

A slow wasting of the muscles, beginning in a limited manner and extending to all voluntary muscles.

What is the etiology of progressive muscular atrophy?

It is more common in males than in females, being usually an affection of adult life. Heredity may play some part in its development. Mental excitement, exposure to wet and cold, injury to the spinal cord, concussion, syphilis, lead-poisoning, acute infectious diseases, may act as exciting causes.

What is the pathology of progressive muscular atrophy?

The affected portion of the spinal cord (usually the cervical portion is first affected) is softer and smaller than normal in the region of the anterior cornua; the ganglion-cells have mostly disappeared; the anterior roots and motor fibres of the peripheral nerves and the muscles supplied by them are atrophied. The atrophy of the muscles may be simple or degenerative.

What are the symptoms of progressive muscular atrophy?

The prodromata consist of aching and loss of strength in the affected portions, mostly the upper extremity. The atrophy is first noticed in the small muscles of the thumb; the ball of the thumb becomes flat, and the thumb is in close apposition to the second metacarpal bone. Soon the interossei atrophy, and the palm of the hand is sunken, and the fingers assume a claw-like appearance from the action of the extensors. Next the muscles of the forearm or those of the shoulder waste away, and the same change takes place in those of the trunk. Those of the neck are rarely implicated. Movements with the arms become difficult, and when the diaphragm or the intercostal muscles become affected respiration is interfered with. A fibrillar twitching of the affected muscles is noticed early in the disease. The electric excitability may be lost or show a reaction of degeneration. Trophic and vaso-motor disturbances, as mentioned in the sections on these subjects, may occur. The tendon reflexes are always absent. The sensation remains normal; the bladder and rectum do not lose their functions. Atrophy of the muscles of the leg is much rarer, and less marked when it does occur. The face and tongue usually escape the atrophy. The process is very slow, and it may be years

before the muscles that are supplied from the medulla begin to atrophy. When their nuclei are attacked we have all the symptoms of a chronic bulbar paralysis.

What are the diagnosis, prognosis, and treatment of muscular atrophy?

The *diagnosis* is sometimes difficult, on account of an excessive development of fat during the course of the disease, masking the muscular atrophy. The disease must be differentiated from amyotrophic lateral sclerosis.

The *prognosis* is bad, as it always ends fatally, though it may be prolonged for a good many years.

The *treatment* is symptomatic. General healthy surroundings, proper food, massage, electricity, may prolong life. (It is claimed by some authors that injections of strychnine can arrest the disease permanently.)

The two following diseases are now presented, to contrast with the preceding.

PSEUDO-HYPERTROPHY OF THE MUSCLES.

What is pseudo-hypertrophy of the muscles?

A morbid condition limited to the muscles, and not dependent on a lesion of the central or peripheral nervous system.

What are the etiology and pathology of pseudo-hypertrophy of the muscles?

It is an affection almost wholly limited to youth, and showing in many cases a congenital predisposition. Male children are more liable to be attacked than female. There is a decided atrophy of the muscles, as in chronic progressive muscular atrophy, but this atrophy is concealed by a great increase in fatty tissue.

What are the symptoms of pseudo-hypertrophy?

It is gradual in its onset. The child has difficulty in walking from weakness in the muscles of the back, trunk, and lower extremities. The gait is waddling; the abdomen is very prominent; the spinal column shows a decided forward curve in the lumbar region; the legs are raised with difficulty; and the toes droop. Sooner or later the movements in the upper extremities become interfered with. The muscular groups show a great increase in volume from superabundant development of fat, but occasionally there is no pseudo-hypertrophy. Reaction of degeneration is never noticed. Sensation is normal, and the functions of the bladder and rectum are preserved. In some cases mental weakness has been noticed.

What are the prognosis and treatment of pseudo-hypertrophy?

The affection advances steadily, and usually terminates fatally from respiratory disturbance or some other intercurrent disease.

The *treatment* is purely symptomatic.

ERB'S FORM OF JUVENILE HEREDITARY MUSCULAR ATROPHY.

This is a form of muscular atrophy hereditary in some families, and attacking chiefly the female members of the family.

What are the symptoms of hereditary muscular atrophy?

In nearly all cases certain sets of muscles atrophy, while others remain perfectly normal. Those mostly attacked are the pectorales, trapezius, latissimus dorsi, serratus magnus, rhomboidei, sacro-lumbalis, and longissimus dorsi. The muscles of the arm and forearm withstand the effect of the disease for quite a long time. In the lower extremities the glutei, quadriceps, peronei, and tibialis anticus are first to suffer. The functions of the respective parts are soon interfered with, slowly progressing till the loss of function is complete. Sensation, as a rule, is not interfered with, and reaction of degeneration is absent. In some cases the atrophy is chiefly limited to the face. Examinations of the peripheral nerves and the spinal cord have failed to give any evidence of pathological changes.

What are the prognosis and treatment of Erb's form of atrophy?

The *prognosis* is not favorable, as the disease slowly but persistently progresses toward complete paralysis and death.

The *treatment* is purely symptomatic.

SPASTIC SPINAL PARALYSIS.

What is spastic spinal paralysis?

A gradually increasing paralysis, progressing from below upward, with muscular tension, reflex contractions and contractures, a decided increase of tendon reflexes, with absence of disturbance of sensation, of vesical, rectal, sexual, and mental derangement or of trophic changes.

What are the etiology and pathology of spastic spinal paralysis?

It occurs mostly between the ages of twenty and forty. Heredity, syphilis, concussion of the spine, exposure to wet and cold, acute diseases, or congenital causes may produce this form of paralysis. The anatomical lesion consists of a sclerosis of the lateral columns.

What are the symptoms of spastic spinal paralysis?

The most prominent *symptoms* are motor paralysis and decided increase in tendon reflexes. At first the patient notices a weakness in the legs, increasing very slowly. The tendon reflexes, especially in the lower extremities, are greatly exaggerated. There are reflex contractions, causing soon rigidity and even contractures. There may be reflex spasms in the muscles. Soon motion becomes decidedly disturbed, the gait becomes stiff and paretic, and there is a tendency to walk on the toes—the

"spastic-paretic gait." In some cases the motor disturbances are hardly noticeable, while the tendon disturbances are always marked. Other spinal symptoms, as a rule, are entirely absent. The disease is very slow in its progress, and may last many years, gradually attacking the chest and the upper extremities.

What are the diagnosis and treatment of spastic spinal paralysis?

Chronic hydrocephalus, transverse myelitis, compression of the spinal cord, multiple sclerosis, and locomotor ataxia may resemble this form of paralysis.

It is treated as chronic myelitis. Warm baths are very beneficial for the spasms.

ACUTE AND CHRONIC POLIOMYELITIS.

What is poliomyelitis?

An atrophic spinal paralysis, occurring mostly in children.

What are the etiology and pathology of poliomyelitis?

It occurs mostly—and according to some authors exclusively—among children. It is noticed more in warm weather, and seems to show an infectious nature. The anterior gray cornu of one side is usually affected, being changed to sclerosed tissue. The atrophy extends through the anterior nerve-roots to the periphery and thence to the muscles.

What are the symptoms of acute and chronic poliomyelitis?

The acute form is sudden in its onset, as a rule. High fever or chills, general malaise, pain all over the body, decided cerebral symptoms, like delirium or convulsions, and clonic contractions, generally usher in the disease. These prodromata may last a short while or several weeks, after which the paralysis is noticed, being extensive as a rule, and affecting one, two, or all the extremities, and sometimes the muscles of the trunk. The general paralysis soon disappears, being left permanently only in one or the other extremity, chiefly in one leg. The cerebral and other symptoms completely disappear, the general condition becomes normal, and the loss of motion in the extremity is the only trace left of the disease. The paralyzed part atrophies rapidly, the reaction of degeneration becomes noticeable after a few weeks, and sometimes the extremity shows a partial arrest of development. The tendon and cutaneous reflexes are absent, sensation is normal, but trophic disturbances soon appear. After a while contractures and subsequent deformities of the extremities appear.

In adults the disease is very rare, but it differs little from that described above. The onset is sudden; the paralysis quickly follows, affecting single groups of muscles or one-half or the whole of the body. The subacute and chronic forms differ from the acute form in the less rapid

development of paralysis, beginning with weakness, tenderness on pressure, paræsthesia, and then followed by paralysis, which becomes stationary for a long time, but may ultimately show signs of recovery.

What are the diagnosis, prognosis, and treatment of poliomyelitis?

We must differentiate the acute form from certain cerebral diseases, hereditary muscular atrophy, and spastic spinal paralysis. In adults it sometimes resembles neuritis.

The *prognosis* in the acute stage is somewhat doubtful. The paralysis often improves, and recovery is known to have occurred, but prognosis in this respect is unfavorable if the paralysis shows no decided change within the first few months. In adults the recovery is more frequent.

The *treatment* during the acute symptoms consists of ice to the head, counter-irritants along the spinal column, tepid baths for the fever, and calomel internally. Electricity kept up constantly, sometimes for years, may prove of great benefit in the chronic cases. Massage, gymnastics, passive motions, baths, greatly aid us in preventing contractures. Internally, tonics, iodide of potash, and strychnine may be used. Ergotine and atropine subcutaneously have been used with success.

ACUTE ASCENDING SPINAL PARALYSIS.

What is acute ascending paralysis?

A paralysis beginning in the lower and rapidly extending to the upper extremities, not based on any known anatomical lesions. The functions of the bladder and rectum are always normal.

What are the etiology and pathology of ascending spinal paralysis?

It occurs more frequently in males than in females—between twenty and forty years. Exposure to cold, alcoholism, infectious diseases, traumatism, and septic diseases act as exciting causes. The affection is supposed to depend on an infective agent of an unknown nature.

What are the symptoms of ascending spinal paralysis?

Prodromata of malaise, pain in the head, tingling in the extremities, are sometimes noticed. These premonitory symptoms, as a rule, are followed by a sudden appearance of paresis in one or both legs. The weakness soon spreads to the arms, the thorax, and the diaphragm. The reflexes are diminished or lost. Sensation is diminished, but electrical excitement remains normal in most cases. The vaso-motor disturbances and sweating are sometimes marked. The paresis soon progresses to paralysis, and, respiration becoming interfered with, death follows more or less rapidly. The temperature during the course of the disease is usually increased considerably, and in some cases an albuminuria has been observed.

What are the diagnosis, prognosis, and treatment of ascending paralysis?

We must differentiate it from multiple neuritis. The *prognosis*, as a rule, is unfavorable, the affection terminating fatally within a few days or a few weeks. Occasionally there is an arrest of the symptoms.

Galvanism and counter-irritants along the spine are useful. Internally, iodide of potash, mercury, and ergot are given. Inunctions of mercury are often used.

NEW GROWTHS OF THE SPINAL CORD AND OF ITS MEMBRANES.

Tumors may appear in the spinal cord or membranes, giving rise to different symptoms according to their seat.

What varieties of new growths do we meet with?

Most commonly gliomata, also tubercles, syphilomata, and myxomata. In the meninges, carcinoma, sarcoma, fibroma, lipoma, myxoma, and gummata have been found. Cysts or collections of pus may also give symptoms of a morbid new growth. The tumor may be single or multiple, and sometimes two varieties are found blended in one tumor.

What are their common symptoms?

Nearly all tumors show their presence with the appearance of symptoms of compression, such as shooting pains and motor weakness, which latter is soon increased to paralysis. The *symptoms* are at first confined to one side of the body, as a rule, but later greatly resemble diffuse chronic myelitis, becoming general. According to the seat of the morbid growth, the symptoms appear in correspondingly different parts of the body supplied by the compressed nerve.

What are the prognosis and treatment of tumors of the cord and membranes?

The *prognosis*, as a rule, is unfavorable. Most cases end fatally after a shorter or longer period.

The *treatment* is symptomatic and, in selected cases, surgical.

CAVITIES AND FISSURES IN THE SPINAL CORD.

What is the pathology of cavities and fissures in the spinal cord?

Cavities may originate from a dilatation of the central canal (hydromyelus), or they may form within the substance of the cord (syringomyelia). The cavity, as a rule, extends only over a small portion of the cord. Most of the cavities and fissures arise from congenital causes, but occasionally from pressure of tumors and extravasations.

What are the symptoms?

These vary according to the location of the cavity. Some cases pre-

sent no *symptoms* during life. When the cavity is extensive the symptoms are very complex, and *diagnosis* can hardly ever be made.

What are the prognosis and treatment?

The affection is chronic in duration, and always ends unfavorably. The *treatment* is that of chronic myelitis.

UNILATERAL LESION OF THE SPINAL CORD.

What is unilateral lesion of the cord?

A group of symptoms due to a unilateral affection in a part of the spinal cord.

What are the etiology and symptomatology of unilateral lesion?

It is caused by direct injury, inflammation, and compression from tumors. As the sensory fibres of one side of the cord are at every level decussating and passing to the other side of the body, while the motor fibres pass on the same side to the periphery, it is evident that in unilateral lesion we have loss of motion on one side, and loss of sensation on the other corresponding side of the body. On the paralyzed side sensation is usually abnormally increased, with the exception of the muscular sense, which is diminished. Corresponding to the level of the lesion in the spinal cord there is a slight anæsthetic zone above the paralyzed part. The reflexes are increased, and the temperature is usually higher on the paralyzed than on the anæsthetic side. Micturition and defecation are disturbed, and there are shooting pains in the affected parts.

What are the prognosis and treatment of unilateral lesion?

Prognosis and *treatment* entirely depend on the primary affection.

DISEASES OF THE MEDULLA OBLONGATA.

PROGRESSIVE BULBAR PARALYSIS.

What is progressive bulbar paralysis?

A progressive disintegration of the nuclei in the medulla oblongata.

What are the etiology and pathology of progressive bulbar paralysis?

The etiology is obscure. Cold, emotions, traumatism, and physical exertion may act as exciting causes. The affection is usually found in middle-aged men. The nuclei of the nerves which act on the atrophied muscles are found under the microscope to have undergone degeneration or to have completely disappeared. The connective tissue is increased; the nerve-fibres, and subsequently the muscles, also atrophy.

What are the symptoms of progressive bulbar paralysis?

The *symptoms* appear gradually, and may be preceded by prodromata of general pain. As a rule, the disease is first manifested by a difficulty in articulation. The difficulty lies in pronouncing the letters that are uttered with the aid of the tongue (alalia). The tongue itself becomes flabby and atrophies progressively, and soon becomes completely paralyzed. The power of speech and of deglutition is lost. With the tongue the lip becomes affected too, and the labial sounds are pronounced with difficulty. The face assumes a thin aspect from atrophy of various muscles of expression. When the muscles of the pharynx and larynx become paralyzed deglutition and respiration are interfered with. Food may enter the larynx, producing pneumonia. The reflexes, as a rule, are diminished or absent, but occasionally an increase in the tendon reflexes of the muscles of the face is met with. Occasionally the muscles of mastication are also attacked by the atrophy. The reaction of degeneration can only exceptionally be demonstrated, as only portions of the affected muscles atrophy. Sensation always remains normal. Salivation occurs in most cases, as well as vaso-motor disturbances.

Occasionally other nuclei may be attacked in the medulla, producing symptoms different from those just given. In some the ocular muscles are affected, while in others both sides of the face are symmetrically attacked. But these forms are very rare.

What are the prognosis, diagnosis, and treatment of bulbar paralysis?

The *course* of the disease is very protracted, although there may be a temporary arrest of the symptoms. It lasts several years, and, as a rule, ends fatally. Differentiation should be made from slowly-developing tumors of the medulla, thrombosis and hemorrhage in the medulla, and bilateral cerebral affections. There is a great similarity in the pathogenesis and course of this affection and of progressive muscular atrophy and amyotrophic lateral sclerosis.

Galvanization is successful in some cases in arresting the progress of the disease for quite a long time. A proper and careful nourishment should be given. In other respects the affection is treated symptomatically.

HEMORRHAGE INTO THE MEDULLA AND THE PONS.

What are the etiology and pathology of hemorrhage into these parts?

It occurs more often than in the spinal cord, but less often than in the brain. It is probable that preceding the hemorrhage there is always some disease of the blood-vessels. Cardiac disease, nephritis, and alcoholism act as predisposing, and injury and local inflammation as exciting, causes. The pathological appearance is analogous to that of cerebral hemorrhage.

What are the symptoms of hemorrhage into the medulla and the pons?

The *symptoms*, as a rule, develop suddenly. Occasionally there are prodromata of headache and spasms, followed by dizziness or loss of consciousness. The patient may die if the hemorrhage is extensive. In most cases bulbar paralysis of large or small extent follows. The tongue, the pharynx, the face, and the extremities may be paralyzed. The paralysis is usually unilateral, the upper and lower extremity on one side being affected and the face on the other side, because of the decussation of the facial nerve-fibres above the pyramids. Sensation is rarely interfered with, except when the pons is affected. Vaso-motor and respiratory disturbances may also present themselves, and an elevation of the temperature and a quickening of the pulse are sometimes noticed.

What are the prognosis and treatment?

Prognosis is favorable if symptoms of absorption present themselves. The *treatment* is symptomatic. Rest, iodide of potash, and galvanization are of great benefit.

EMBOLISM AND THROMBOSIS OF THE BASILAR ARTERY.

What is the etiology of embolism and thrombosis?

The medulla and pons derive their chief blood-supply from the basilar artery. An occlusion in any of the branches of the artery may produce a softening in these parts and a subsequent bulbar paralysis. Thrombosis is usually a result of a disease of the artery, while embolism may follow heart disease. The pathological condition is analogous to softening of the cerebrum from embolism.

What are the symptoms of embolism and thrombosis?

As soon as the occlusion takes place in the artery there may be an apoplectic attack or a sudden development of paralysis. If the patient survive, the subsequent symptoms are those of hemorrhage into the medulla, with decided bulbar symptoms.

What are the prognosis and treatment?

If circulation is not restored to normal, death usually ensues.

The *treatment* is symptomatic.

ACUTE BULBAR PARALYSIS.

What is acute bulbar paralysis?

An affection characterized by an acute development of marked bulbar symptoms.

What are the etiology and pathology of acute bulbar paralysis?

It is very rare in occurrence, and little is known regarding its etiology.

The *pathology* is probably based on an acute inflammation of the medulla.

What are the symptoms of acute bulbar paralysis?

There may be prodromata of headache and vague pains all over the body, followed, as a rule, by decided bulbar symptoms, such as interference with deglutition, the speech, and the respiration. The temperature, as a rule, is elevated, the pulse is rapid. The extremities are attacked in only very few of the cases.

What are the prognosis and treatment of acute bulbar paralysis?

Death occurs in most cases within a short time from interference with respiration.

The *treatment* consists of alleviation of painful symptoms.

COMPRESSION OF THE MEDULLA.

What is the etiology of compression of the medulla?

Injuries may cause a sudden compression, followed by instant death. Disease of the bones and structures surrounding the medulla, tumors, and aneurism may produce gradual compression.

What are the symptoms of compression of the medulla?

The *symptoms* are due to pressure on the nerve-tracts, causing an interruption in their conduction. No exact rules can be drawn up as to the manner of manifestation of the different symptoms. The bulbar symptoms are most pronounced, but cerebral symptoms may also appear later on in the disease.

What are the prognosis and treatment?

The *prognosis*, as a rule, is bad.

The *treatment* is like that of bulbar paralysis.

DISEASES OF THE BRAIN.

Diseases of the Cerebral Meninges.

HÆMATOMA OF THE DURA MATER.

What is hæmatoma of the dura mater?

An accumulation of effused blood met with on the inner surface of the dura mater.

What are the etiology and pathology of hæmatoma of the dura mater?

Hemorrhagic effusions of the dura mater are usually extensive. The disease may complicate diseases of the heart, lungs, or kidneys, infectious

diseases, alcoholism, anæmia, and is more common in men than in women. It often follows traumatism, and has been noticed in paralysis of the insane. In milder cases there is usually found a thin encapsulated layer of clotted blood; in chronic cases there are, as a rule, several successive layers. The collection of the blood is found most commonly in the parietal region or at the base of the brain.

What are the symptoms of hæmatoma of the dura mater?

If the effusion is slight there are no marked *symptoms*, as a rule. The onset of the hemorrhage is usually sudden in the more pronounced cases: a sharp pain in the head, followed by stupor or coma, a slow pulse, and sometimes a contraction of the pupils. The subsequent symptoms depend upon the size and the location of the effused blood. If in the neighborhood of the motor region, there is paresis, paralysis, or muscular twitching on the opposite half of the body. If the effusion spreads to the other side of the motor region, there may be general paralysis from a compression of the cortical motor-centres. In some cases the muscles of one-half of the face may be paralyzed or aphasia is produced. If the effusion be very extensive, death soon follows. Improvement, and even complete recovery, can take place when the blood-clot is absorbed, but it is a characteristic of dural hemorrhages that they show a tendency to frequent recurrence.

What are the prognosis, diagnosis, and treatment of hæmatoma?

The affection is very protracted as a rule, but recovery may occur.

The *diagnosis* is not easily made, and the symptoms may be completely obscured by the primary disease.

Constant application of ice to the head, bloodletting, and drastic purges are old-fashioned methods, but may be of benefit. If paralysis follows, we must treat that accordingly. In case of recovery we must carefully guard against a recurrence of the attack.

PURULENT MENINGITIS.

What is purulent meningitis?

A purulent inflammation of the cerebral dura mater or pia mater.

What are the etiology and pathology of purulent meningitis?

It occurs rarely on the dura mater, but more often on the pia mater. If primary, it is due to a specific micro-organism. The secondary form follows diseases of the cranium, inflammation of the ear, traumatism, inflammation of the cranium, the infectious diseases, pneumonia, and systemic septic diseases. The pathology is that of cerebro-spinal meningitis. The convexity is the part usually attacked. The brain in most cases becomes secondarily affected.

What are the symptoms of purulent meningitis?

If the affection be primary, it is ushered in mostly by a chill and a

rise of temperature. The head aches greatly, and soon the pain becomes violent. Vertigo, delirium, or coma may be added. In addition there may be symptoms referable to an irritation of the cranial nerves, such as nystagmus, trismus, disturbance of hearing or sight, and fibrillar twitchings in the muscles. The head is drawn back, and occasionally there are also convulsions. The pulse is usually rapid and the temperature high. Vomiting has been noticed in many cases. Constipation and diminution in the quantity of urine are the rule. In secondary cases the onset of the disease may be wholly obscured by the primary affection.

What are the prognosis, diagnosis, and treatment of purulent meningitis?

The affection lasts but a few days, and is nearly always fatal. Differentiation must be made from typhoid, septic diseases, uræmia, and general tuberculosis.

The *treatment* is symptomatic. As a prophylactic measure purulent affections of the ear, etc. should be promptly attended to.

TUBERCULAR MENINGITIS.

What is tubercular meningitis?

An inflammation of the pia mater of a tubercular nature.

What are the etiology and pathology of tubercular meningitis?

The affection, as a rule, is not primary, but follows other tubercular diseases, such as phthisis, tubercular pleurisy, tubercular disease of the joints, and tubercular glands. It is more common in children than in adults. Heredity is one of the predisposing factors. The pia mater is more or less covered with miliary tubercles and is the seat of inflammation. As a result of the inflammation the pia mater is covered with a serous exudate. If the exudation is large, the brain is found to be compressed. Secondary tubercular inflammation of the brain and spinal cord may also be found. The part usually affected is the pia mater at the base of the brain.

What are the symptoms of tubercular meningitis?

The *symptoms* of the primary affection precede and often obscure those of the meningitis. The beginning of the tubercular process in the meninges is usually announced by the development of severe headache, vomiting, and restlessness. Soon the headache increases, and delirium may supervene. The patient is restless, can hardly be roused, and moans if headache be severe. If the motor-centres are irritated, there are muscular twitchings, occasionally convulsions, paresis, or paralysis. The eyeball and ocular muscles may also show evidences of an irritation of the nerves supplying them: there may be strabismus, nystagmus,

slow reaction of the pupils to light, etc. The reflexes are at first increased, but soon become diminished. The temperature may show a constant slight elevation or a variation. The pulse, at first slow, becomes rapid later on. The respiration is rapid as a rule, and may assume the Cheyne-Stokes character (a pause in the breathing, followed by slight inspirations, which grow deeper and deeper, then diminish gradually till the respiration stops again). There is constipation, and an impairment of general nutrition becomes marked, and death finally ensues from general marasmus and paralysis.

In children the prodromal symptoms extend over a long space of time. Besides the headache, they complain of pain in the chest and abdomen. The child soon becomes comatose, occasionally emitting a loud scream (the "cephalic cry"). Convulsions are more common in children than in adults. The other symptoms are analogous with those in adults.

What are the prognosis, diagnosis, and treatment of tubercular meningitis?

The *prognosis* is bad, although some authors claim that recovery is possible.

Differentiation should be made from purulent meningitis, septic disease, and uræmia.

Ice to the head, bloodletting, mercurial inunctions may be tried. Internally, a strong purgative, iodide of potash, and alcoholic stimulants are given. For pain and delirium narcotics should be employed.

THROMBOSIS OF THE CEREBRAL SINUSES.

What are the etiology and pathology of thrombosis of the sinuses?

Thrombosis in the cerebral sinuses is always a grave affection. Phthisis, cancer, general marasmus, and acute specific diseases act as predisposing causes; suppurating disease of the cranial bones, erysipelas, and mastoid abscess act as exciting causes. The longitudinal sinus is the one mostly affected. The thrombus, when extensive, may cause hyperæmia in the meningeal and cerebral veins, and subsequent extravasation of blood.

What are the symptoms of thrombosis in the cerebral sinuses?

When slight, the *symptoms* are not noticeable. When severe and occurring in children, there is a sudden development of hemiplegia, attended with convulsions and muscular twitchings. In adults there may be prodromata of headache, delirium, and visual disturbances, followed by hemiplegia. When the thrombus begins to suppurate there are symptoms of septic infection. The paralysis may be permanent or transient, depending on the absorption or elimination of the clot.

What are the prognosis and treatment?

The *prognosis* is not very favorable, especially when septic symptoms develop.

The *treatment* is symptomatic.

Diseases of the Brain-substance.

DISTURBANCES OF CIRCULATION.

What disturbances of circulation do we meet with in the brain?

Anæmia and hyperæmia.

What are the causes and symptoms of anæmia?

Temporary or permanent diminution in the blood-supply of the brain may be caused by cardiac weakness, mental excitement, and general anæmia. Certain drugs, like chloroform (when inhaled), may also cause cerebral anæmia. The *symptoms* are known as the "fainting spell." Dizziness, ringing in the ears, spots before the eyes, nausea, and occasionally vomiting, precede the loss of consciousness, which may last a variable time. The face is pale, the pulse small, and the body is covered with a cold perspiration. In cases of general anæmia the drowsiness is constant and the patient complains of an obstinate headache.

What are the causes and symptoms of hyperæmia?

Temporary or permanent increase in the blood-supply of the brain may be caused by the chronic use of alcohol and tobacco, by mental overexertion, and by chronic plethora. The *symptoms* of cerebral hyperæmia ("rush of blood to the head") begin with a sense of warmth in the head. The face is red, the arteries in the neck are strongly pulsating. The patient complains of violent headache and tinnitus. In some cases stupor follows, while in others an attack of mania may be brought on. The attack may last a few minutes or longer, dependent on the exciting cause.

What is the treatment of cerebral anæmia and hyperæmia?

In anæmia, rest, the horizontal position, mild stimulants, and cold douches; in hyperæmia, rest, elevation of the head and shoulders, cold to the head, foot-baths, and strong purgatives or bloodletting. Try to remove the cause.

THE LOCALIZATION OF CEREBRAL DISEASES.

What is localization?

The inference of the locality of an affection from the symptoms it produces.

Where are the various centres located in the brain?

The upper third of the central convolutions contains the centre for the movements of the leg of the opposite side. The middle third of the central convolutions contains the centres for the movements of the arm of the opposite side. The upper part of the lower third of the central convolutions contains the centre for the muscles of one-half of the face, and the lower part contains the centre of the muscles of the lips and tongue.

The frontal convolutions contain no motor-centres in their upper two-thirds. The lowest frontal convolution on the left side contains the centre of speech.

The parietal convolutions have no motor-centres, but are said to contain the centres of the cutaneous and muscular sensation.

The occipital convolutions (especially the cuneus) contain the cortical centre for visual sensations, a lesion here producing hemiopia (only one-half of the field of vision being perceived), and occasionally a loss of visual memory.

The temporal convolutions (especially the uppermost) contain the centre of hearing of the opposite side. The anterior part of the lobe contains the centre of smell.

The centrum ovale contains the fibres of the various cortical centres; consequently injury may cause analogous symptoms, as an injury of the cortical portions: hemiplegia, hemianopia, word-deafness, aphasia, and monoplegia.

The central ganglia (caudate nucleus, lenticular nucleus, and thalamus opticus), when injured, produce temporary hemiplegia or hemianæsthesia. The posterior portion of the thalamus also contains the centre for part of the optic nerve.

The internal capsule contains in its posterior limb the pyramidal tract, and injury produces complete hemiplegia on the opposite side of the body. The posterior extremity of the internal capsule contains the sensory tract, and injury produces hemianæsthesia, and sometimes loss of the special senses.

The anterior pair of corpora quadrigemina contain the fibres of the optic nerve, and injury to both causes total blindness.

The crura cerebri contain the pyramidal tracts, the sensory fibres, and the nucleus of the third nerve.

The pons Varolii contains the motor-fibres of the opposite side of the face, arm, and leg, and the nuclei of the fifth, the sixth, and the third nerve of the same side.

The medulla oblongata contains the cardiac and respiratory centres, the nuclei of the hypoglossal, spinal accessory, and glosso-pharyngeal nerves, and the motor-fibres for the opposite side of the body.

Affection of the cerebellum produces uncertainty of gait (ataxia) and a marked vertigo.

Affection of the crura ad pontem produces forced positions and forced movements.

APHASIA AND ALLIED AFFECTIONS.

What is aphasia?

Loss of speech, either from inability to revive voluntarily the word-images (amnesic aphasia) or from inability to execute the co-ordinative movements necessary for the pronunciation of a word (ataxic aphasia).

What are the symptoms of aphasia?

In amnesic aphasia the patient is aware of the nature of the object, but is unable to pronounce its name, as he has forgotten it. This amnesia may be partial, when only part of a word is forgotten, or complete, when the whole word is forgotten. In ataxic aphasia the patient is perfectly well able to recollect the name of an object, but is unable to pronounce it, as the power to transfer the word-image into sound is absent. The ataxia may be complete, when the patient can utter only separate sounds, or partial, when words are only slightly mispronounced, and when some certain words cannot be pronounced at all.

What other allied affections are to be met?

Monophasia, when a patient's whole vocabulary consists of one word; paraphasia, when words are confounded; sensory aphasia, or word-deafness, when a word does not call up the corresponding image; agraphia, an inability to write down the thoughts; alexia, an inability to read the written words; amimia, an inability to perform pantomimic movements to aid in the expression of words; apraxia, an inability to recognize surrounding objects for what they are.

What is the localization of aphasia and its treatment?

The centre for speech is situated in the third left frontal convolution. Word-deafness is probably due to injury to, or disease in, the first left frontal convolution.

The *treatment* consists of persistent exercise in speaking and language.

CEREBRAL HEMORRHAGE.

What is the etiology of cerebral hemorrhage?

Hemorrhage into the brain-substance is almost always due to an affection of the walls of the large or small cerebral arteries (miliary aneurism), producing rupture and subsequent hemorrhage. The veins are rarely affected. The aneurism may affect the larger arteries or the minuter arteries, and the miliary aneurisms are always abundant in number. It occurs mostly in persons over fifty years old, and is more common in men than in women. It is sometimes hereditary. Syphilis, gout, and the alcoholic habit predispose to its occurrence. Disease of the heart, violent mental or bodily exertion, combined with an elevation of arterial tension, may cause a rupture of a cerebral artery. Pernicious anæmia, septicæmia, severe infectious diseases, and direct injury may also be productive of cerebral hemorrhage. Hemorrhage is most frequently met

with in the corpus striatum, from rupture of one or the other middle cerebral artery or of one of its branches, and hardly ever occurs in the cortex.

What is the pathology of cerebral hemorrhage?

When the hemorrhage is extensive the surrounding parts are compressed. The effused mass is surrounded by a wall of torn cerebral tissue, and the blood-clots are mixed with broken-down nerve-tissue and fat-cells. The parts surrounding the clot are softened. The clot is sometimes absorbed, and leaves in its place a cyst filled with serum. Occasionally the absorption is complete, and only a scar is left to indicate the seat of lesion. The blood-vessel, before the rupture, is usually found in an atheromatous condition.

What are the symptoms of cerebral hemorrhage?

In most patients the onset is sudden. In some there are prodromata of headache and a feeling of tension, due to a disturbance of the arterial circulation. When the hemorrhage takes place there is usually *loss of consciousness*. The nearer the hemorrhage to the cortex, the more pronounced are the symptoms. If the hemorrhage is extensive, the patient falls suddenly into a *deep coma*, and it may soon prove fatal. If the hemorrhage is slight at first and gradually increases, the symptoms correspondingly grow worse: the patient at first is *delirious*, then *one arm*, *one side*, and finally the *whole body*, become *paralyzed*, and unconsciousness, even death, may ensue from paralysis of the cardiac and respiratory centres. In most cases the symptoms begin with a loss of consciousness. The face is red, the pulse is full and slow, the respirations are slow and deep; the temperature, at first subnormal, becomes elevated. The head and eyes are sometimes persistently fixed in one direction, mostly toward the injured side. The *pupils* are contracted, dilated, or normal. The paralysis may not be noticeable at first during the comatose state, as the patient lies perfectly motionless, but in some instances there is a *tonic rigidity* of the muscles when the hemorrhage is located in the lateral ventricle, or there are epileptiform convulsions when the hemorrhage occurs near the cortical motor-centres. The urine is suppressed or involuntarily passed, and usually contains a slight percentage of albumin. Sensation seems to be retained to a greater or less degree. In some cases the deep coma is followed by death; in others the clot in the brain is gradually absorbed and there is a slow return to consciousness. Occasionally relapses from renewed hemorrhages occur. In *mild cases*, instead of the deep coma, there are only *headache*, *faintness*, *nausea*, and *vomiting*. The damage resulting from cerebral hemorrhage depends on the location of the clot. In some cases the resultant symptoms are only temporary if the blood-clots become absorbed. In other cases the injury is permanent, as a destruction of brain-tissue from constant pressure of the clot may follow.

In most cases the apoplectic attack is followed by hemiplegia of one-half of the body, opposite to the seat of injury: one side of the *face* appears flatter than the other; the corner of the *mouth* on the well side is drawn over; the *eyelids* close imperfectly on the paralyzed side; the tip of the *tongue* when protruded points toward the paralyzed side, and articulation may not be complete; the soft *palate* appears more flabby on the paralyzed side, and the uvula deviates to one side or the other; the *shoulder* on the paralyzed side is lower than on the sound side; the *chest* on the affected side does not expand as freely as the other side; the *upper* and the *lower extremity* on the paralyzed side are totally immovable, or only certain groups of muscles are affected, or the affected limbs are simply paretic. The *tendon reflexes* are exaggerated, the *skin reflexes* are diminished. Sensation is normal except when the internal capsule is involved, in which case there is also hemiopia.

In many cases the paralyzed parts gradually regain their functions within a few weeks, but restoration is not always complete. The lower extremity is first to improve, the arm following later. The improvement gradually goes on for a few months, but after the sixth month improvement seems to come to a standstill and the paralyzed muscles become contracted. Occasionally involuntary movements have been observed in the paralyzed parts (post-hemiplegic chorea). Reaction to electricity is usually normal. Trophic and vaso-motor disturbances and swelling of the joints may occur when the disease is of long duration. The general nutrition remains good, and only rarely do mental symptoms manifest themselves.

What are the diagnosis and prognosis of cerebral hemorrhage?

Cerebral embolism, meningitis, and uræmic coma greatly resemble cerebral hemorrhage.

The *prognosis* is favorable if the patient survive the primary shock. We must be guarded in giving a prognosis as to ultimate favorable recovery.

What is the treatment of cerebral hemorrhage?

At the time of the occurrence of the shock rest, elevation of the head and shoulders, ice to the head, are advisable. If there is congestion, bleeding is beneficial; if the pulse is weak, stimulants should be administered. The subsequent symptoms are treated on general therapeutic principles. For the pain and restlessness morphine is given. For the paralysis, after it has shown no signs of improvement, electricity, especially galvanism, may be used. Iodide of potash, ergot, and strychnia are also in use. The various bathing-places may aid in the restoration to health. If we can detect the predisposing cause of the hemorrhage, the patient should be guarded against any recurrence of the attack.

EMBOLISM AND THROMBOSIS, FOLLOWED BY CEREBRAL SOFTENING.

What are the etiology and pathology of embolism and thrombosis?

A plug may be carried by the arterial circulation into the brain, where it is arrested by an artery smaller than the plug (embolism), or a clot may form within the cerebral artery at a certain spot (thrombosis). *Embolism* may be caused by disease of the heart, a morbid affection of the vascular system in any other part of the body, or a general septic disease. *Thrombosis* arises from a local disease of the wall of the cerebral artery, causing a roughening of its surface and a subsequent deposition of fibrin. Severe constitutional illnesses, like typhoid and cancer, syphilitic endarteritis, and arterio-sclerosis, are productive of thrombosis, which in its turn may cause embolism, or *vice versâ*.

If an embolism or thrombosis occur, the circulation is often re-established in the affected part of the brain through the formation of collateral branches; but if this fails to take place, the tissues are deprived of their blood-supply and are transformed into a soft mass, which often assumes a reddish or yellowish tinge from the blood-corpuscles present. This degeneration takes place within a few days, and if collateral circulation be established by that time, the nerve-tissue may be restored; but if not, the destruction is permanent. The soft mass may be absorbed and a cyst or a cicatrix take its place. The artery most commonly affected is the middle cerebral. If the embolism is of septic origin, the local affection in the cerebral artery may be followed by a suppurative disease of the brain.

What are the symptoms of cerebral embolism and thrombosis?

Embolism, as a rule, gives the same symptoms as cerebral hemorrhage, and, according to the size of the artery involved, the shock may be mild or severe; but it is rarely as long continued as the shock of cerebral hemorrhage, and the pulse is not so slow, on account of an absence of compression. The symptoms disappear as soon as the circulation is re-established, but if softening occurs the symptoms are identical with those following cerebral hemorrhage.

Thrombosis is generally slow in its onset, and coma occurs after the thrombus has lasted for some time. In their further course the symptoms of thrombosis are like those of embolism. Cerebral hemiplegia, with or without aphasia, is the most common sequela of thrombosis or embolism, as the middle cerebral artery supplying the internal capsule is generally the seat of affection.

What are the diagnosis, prognosis, and treatment?

Embolism and hemorrhage greatly resemble each other, but in embolism the occurrence is more common in young people than in old, the shock is less severe, and there is nearly always some preceding consti-

tutional disease. A sudden rupture of an abscess may also resemble embolism.

The *prognosis* and *treatment* are the same as in cerebral hemorrhage.

ABSCESS OF THE BRAIN.

Synonym.—Suppurative Inflammation of the Brain.

What are the etiology and pathology of cerebral abscess?

Abscess of the brain is usually produced by injury to the brain, suppurating disease of the cranial bones, the middle ear, and the nasal cavity, pyæmia, and suppurating disease of the heart. Occasionally it seems to be of idiopathic origin, in which case it is probably due to the entrance of a septic micro-organism.

The abscess may be small or large. The pus is of a greenish color, and mixed with broken-down nerve-tissue. The cerebral tissue surrounding the abscess is usually softened from the pressure of pus. A large abscess situated near the cortex may produce a suppurative inflammation of the meninges. Occasionally the abscess becomes encapsulated, preventing an extension of inflammation.

What are the symptoms of abscess of the brain?

Abscesses of small size or of slow development may not manifest their presence by any *symptoms*. The onset of cerebral abscess resembles that of acute meningitis—by delirium, headache, and high fever. In acute cases these initial symptoms are followed by loss of consciousness, coma, and death; occasionally acute cases change into chronic. In chronic cases the primary symptom consists of a chill, persistent headache in the region where the abscess is situated. Vomiting, irregular fever, mental dulness, and optic neuritis may also be present. According to the locality of the abscess there may be different focal symptoms, which were described in the section on *Localization*. The duration of the affection may be weeks or months, and occasionally even years.

What are the prognosis and diagnosis of abscess of the brain?

The disease is nearly always fatal. Occasionally the abscess becomes encapsulated, giving rise to no further symptoms. Cerebral tumor greatly resembles in its symptoms cerebral abscess, but in tumor fever is usually absent, as is also optic neuritis. Purulent meningitis may also give symptoms similar to cerebral abscess.

What is the treatment of cerebral abscess?

In case diagnosis is absolutely certain and the localization from the focal symptoms approximately exact, the surgical procedure of trephining is of great value. If operation cannot be resorted to, the *treatment* is purely symptomatic.

TUMORS OF THE BRAIN.

What forms of cerebral tumors are met with?

Nearly every variety of tumor may be found in the brain, but the most common growths met with are those of a tubercular or syphilitic origin. Tubercles occur mostly during youth, while syphilitic gummata generally afflict adults. They may be single or multiple, and are usually situated in the cortex and in the cerebellum. Gliomata are also of frequent occurrence, originating in the connective tissue surrounding the nerve-elements. Carcinoma and sarcoma have also been found to occur in the brain in some rare cases. Men are more subject to the development of cerebral tumors than women.

What are the symptoms of cerebral tumors?

Most of the new growths originate in the meninges, and by compressing a certain part of the brain they produce their symptoms, such as severe and persistent headache, usually generalized, but occasionly localized at the situation of the tumor; an impairment of the memory; somnolence, apathy, and sometimes dementia; vomiting; a slow, irregular pulse (between 50 and 60) and vertigo; optic neuritis and disturbances of vision; insomnia and loss of flesh and strength. Besides these general symptoms, cerebral tumors also produce local symptoms, either as a result of direct destruction of brain-tissue or as a result of pressure upon the brain-tissue. The most common seat of the different tumors is at the base of the brain, where they cause compression of the various nerve-trunks and subsequent paralysis of the muscles supplied by these nerves. The paralyzed muscles always give the reaction of degeneration, showing that the paralysis is peripheral and not central. When the tumors are situated in the cerebral hemispheres, hemiplegia usually develops, but always very slowly. In general the local symptoms always depend upon the locality of the seat of the tumor. As to the nature of the cerebral tumor, those most commonly found are glioma or syphilitic or tubercular growths. A general tubercular tendency or a syphilitic history points to a tubercular or syphilitic tumor. In young people with no syphilitic history the new growth is likely to be tubercular; in adults with no phthisical history the new growth is likely to be syphilitic. If the tumor follows a carcinoma or sarcoma elsewhere in the body, it is most likely of a malignant nature. Glioma or tubercle occurs mostly in the cerebellum and pons; syphiloma mostly in the cortical substance or the base of the brain; sarcoma mostly outside the brain-substance. Occasionally cysticerci originating from tænia solium are found in the brain, giving rise to epileptiform convulsions or other symptoms according to their situation.

What are the duration, prognosis, and diagnosis of cerebral tumors?

Most tumors are slow in their development, and the symptoms increase

gradually, the disease lasting for months and years, terminating usually in death, except in syphilitic growths, and occasionally in tubercular growths. Gliomata sometimes give rise to hemorrhages, followed by an apoplectic shock. Abscess, softening from embolism and thrombosis, sclerosis, localized meningitis, and chronic hydrocephalus may be mistaken for cerebral tumors.

What is the treatment of cerebral tumors?

Whether there is certainty about the tumor being syphilitic or not, it is always safe to resort to antisyphilitic treatment in strong doses. Arsenic has been used with success in some cases of tubercular growth. If the tumor is not amenable to syphilitic treatment, the affection must be treated symptomatically. Surgical operation has been resorted to in some instances.

CEREBRAL SYPHILIS.

What is the etiology of cerebral syphilis?

The symptoms of cerebral syphilis belong to the tertiary stage of the disease, usually a good many years after the initial syphilitic symptoms have disappeared. Both sexes are equally liable to be attacked by the disease. Hereditary syphilis sometimes manifests itself by cerebral symptoms.

Syphilis may produce a circumscribed tumor, a disease of the arteries, or a general sclerotic infiltration of the brain. The tumors (gummata) are small, yellowish in color, cheesy in the centre, and, if originating in the dura mater, spread to the brain-tissue. The arterial disease causes a thickening of the blood-vessels, a narrowing of their lumina, and thus produces thrombosis.

What are the symptoms and diagnosis of cerebral syphilis?

The *symptoms* of cerebral gummata are the same as those of tumor, and have already been enumerated. When syphilis is diffuse it resembles multiple sclerosis in its symptoms. The memory and speech become impaired by degrees, the motor powers are lost, and after a long, protracted illness the patient finally dies.

What are the diagnosis, prognosis, and treatment of cerebral syphilis?

Tumors, cerebral softening, hemorrhage, sclerosis, and paralysis of the insane resemble cerebral syphilis.

Prognosis is favorable when treatment is resorted to early. Mercurial inunctions should be used very freely, and iodide of potash must be given in large doses. Tonics and good nutrition are combined with these remedial agents.

CHRONIC HYDROCEPHALUS.

What is chronic hydrocephalus?

A dropsical effusion occurring in the ventricles of the brain.

What are the etiology and pathology of chronic hydrocephalus?

Hydrocephalus may be primary, without known cause, or secondary, following meningeal inflammation or the compression from tumors. The affection seems to be hereditary in some families. It is of rare occurrence in adults. The head is enlarged, sometimes to an enormous size, the cranial prominences bulge out, the cranial bones become thinner and flattened out, the fontanelles are widely separated, the ventricles are greatly distended with a colorless fluid of a low specific gravity.

What are the symptoms of chronic hydrocephalus?

Occasionally hydrocephalus is apparent immediately at birth, but in most cases the head begins to swell a few weeks after birth, the increase being very rapid. The enlargement is usually symmetrical; the sutures are separated, and sometimes fluctuation can be detected through the fontanelles. The face is small, and the head, being heavy, easily falls forward or backward. The child is very slow in intellectual development. Symptoms of motor disturbance and motor irritation arise sooner or later, but sensation nearly always remains perfect.

What are the prognosis, diagnosis, and treatment?

Most children gradually succumb to the affection, although a temporary or permanent arrest of the symptoms is possible. In cases not well marked the affection may be mistaken for rachitis.

The *treatment* is symptomatic. Occasionally surgical means have been resorted to, but with no decided success as yet.

NERVOUS AFFECTIONS WITHOUT DISCOVERABLE ANATOMICAL BASIS.

EPILEPSY.

What is epilepsy?

A nervous affection characterized by chronic convulsive attacks, not due to brain disease, and accompanied by loss of consciousness.

What are the etiology and pathology of epilepsy?

It is an hereditary affection in many cases. A neurotic tendency or alcoholic habits in parents is apt to produce epilepsy in the offspring. Bodily or mental excitement, anæmia, febrile diseases, injury to the head, or in a reflex manner injury to the peripheral nerves, parasites, ovarian or uterine diseases, may produce epilepsy in those predisposed to this affection.

No decided anatomical change has as yet been found in the brain or

nerves of epileptics. The convulsions are probably dependent upon intermittent irritations of the cortex cerebri from temporary cerebral anæmia.

What are the symptoms of epilepsy?

In most cases the affection begins in early youth. The attack may not be repeated for years or may recur daily. Alcoholism, sexual excess, fatigue, ovarian disease, pregnancy, often determine the frequency of the attacks. In some the attacks are diurnal, in others nocturnal, and may not be noticed for a long time. The characteristic paroxysm is usually ushered in by the prodromal "*aura*." The aura may be *sensory* (beginning with paræsthesia in the arm, in the leg, or in the stomach, an unpleasant odor, an appearance of color-spots before the eyes, a buzzing in the ears, or with a peculiar taste in the mouth); it may be *motor* (beginning with muscular twitchings or aphasia); it may be *vaso-motor* (beginning with cold and warm sensations, a flushing of the face, or a profuse perspiration); or the aura may be *psychical* (consisting of mental excitement, vertigo, or confusion of ideas). This aura may last a few seconds or a few hours, and is usually followed by the *convulsive stage* (grand mal). The convulsions begin suddenly. The patient falls down, loses consciousness, and often utters a peculiar piercing cry. The convulsions at first are tonic. The *body* is bent *backward*, the *teeth* are firmly *closed*, the *fingers* are *clenched* over the thumb, the *extremities* are *rigid*, breathing stops, the *face* is *cyanotic*, and the *pupils* are *dilated*. This *tonic* convulsion lasts a few seconds, and is succeeded by *clonic* convulsions. Beginning in the *facial muscles*, the contractions extend to the *muscles* of the *eyeball*, the *tongue*, the *neck*, the *arms*, and the *legs*. The tendon reflexes are exaggerated, the cutaneous reflexes are absent. This stage lasts a few minutes, and is succeeded by *coma*, which gives way to a quiet sleep, lasting sometimes for a few hours. Headache, exhaustion, a sore tongue from biting it during the clonic spasm, and pain in the muscles are apt to follow the attack. In some patients the attacks are much milder (petit mal). These attacks are rarely preceded by an aura, and instead of convulsions there is a simple transitory faintness or somnolence. Occasionally violent epileptic spasms are succeeded by an epileptoid condition in which the patient suffers from temporary mental derangement. Different patients may present any number or variety of epileptic seizures. Between the attacks the epileptics seem to be quite well. After attacks lasting a good many years the intellect is apt to become permanently deranged and various cerebral disorders may develop.

What are the prognosis and diagnosis of epilepsy?

In rare instances are epileptic paroxysms followed by death. The affection may last a lifetime, and even after having been arrested for a long time some sudden exciting cause may bring on a recurrence of the

paroxysms. Epileptiform seizures may also occur from cerebral tumors, abscess, multiple sclerosis, and hysteria.

What is the treatment of epilepsy?

Bodily and mental fatigue, alcoholic and sexual excess, should be forbidden. A plain, nutritious diet, proper exercise, and attention to hygienic rules are important. Internally the bromides are used pre-eminently, in large doses and continued over a long period. If bromides fail, valerian, belladonna, arsenic, etc. may be tried. Cold sponging and the galvanic current may do some good. During the seizure nitrate of amyl, ether, or chloroform may be employed. The patient should always be encouraged, as the mind seems to exert a great influence on the production of spasms.

CHOREA (ST. VITUS'S DANCE).

What is chorea?

An irregular spasmodic contraction of a clonic kind of the voluntary muscles, ceasing during sleep, and but slightly under the control of the will.

What is the etiology of chorea?

It occurs mainly among children, and girls are more often attacked than boys. Mental excitement, articular rheumatism, and infectious diseases act as predisposing causes. It is sometimes induced by imitation.

What are the symptoms of chorea?

The onset of chorea is gradual, and occasionally it is preceded by prodromata of restlessness or rheumatic pains. Sooner or later characteristic muscular contractions occur in different groups of muscles, which contractions and movements are independent of the will. These twitchings may affect any group of muscles, but are most common in the arm, which is moved and contorted in every possible manner. These muscular contractions may be very mild or very severe, and occasionally the whole body is attacked by violent movements, causing a rapid loss of flesh and strength from inability to take food properly. The affection appears in most cases only on one side of the body. Sensation and reflex action are normal, and even excessive movements do not seem to fatigue the patient. Some patients exhibit irritability of temper, restlessness, or peevishness.

Whst are the prognosis, diagnosis, and treatment of chorea?

Most cases recover after lasting for a few weeks or a year. Occasionally death follows the very severe cases. Relapses after apparent recovery may occur. Athetosis, paralysis agitans, saturnine and other tremors, may resemble chorea.

Absolute rest, Fowler's solution, bromides, baths, and electricity are of benefit.

PARALYSIS AGITANS (SHAKING PALSY).

What is paralysis agitans?

Continuous and involuntary tremors, attacking various muscular groups of the body, increased by emotion or attempt at movement, and ceasing during sleep.

What is the etiology of paralysis agitans?

The affection does not occur with great frequency, and belongs more to old age than to youth. Traumatism, violent emotion, acute fevers, may act as exciting causes in those predisposed to the disease.

What are the symptoms of paralysis agitans?

The affection is manifested at first by a trembling, beginning in the hands and extending to the arms, the legs, and sometimes to the whole body. The tremor consists of rapid, uniform oscillations, and arises from motor irritation. The trembling is continuous, but is less violent when body and mind are in repose than when the patient is in a state of mental or bodily excitement. The muscles become rigid and shortened; the head becomes flexed; the body is bent forward; the arms, the fingers, and the thumb are flexed; and the legs are bent. Movements soon become impaired, and the extremities show some stiffness on motion. The muscles become paretic, but the reflexes and the functions of the bladder are not interfered with. When the patient is pushed forward ("propulsion"), he has to keep on running to avoid falling; in bed he cannot voluntarily change his position.

What are the prognosis, diagnosis, and treatment of paralysis agitans?

The affection may last many years, and may be temporarily cured, although it always ends in death. Multiple sclerosis greatly resembles paralysis agitans.

The *treatment* is symptomatic: internally arsenic, bromides, ergot may be tried. Electricity may do some good.

TETANY.

What is tetany?

An intermittent form of tetanus, characterized by paroxysms of tonic convulsions in certain sets of muscles.

What is the etiology of tetany?

It occurs mostly among children and young people, and women, especially nursing women, are more liable to be attacked than men. Acute

diseases, exposure to cold, extirpation of a goitre, may be followed by paroxysms of tetany.

What are the symptoms of tetany?

The typical paroxysm is usually preceded by a sensation of weakness and pain all over the body. After a few minutes or hours the convulsions follow, beginning in the upper extremity and extending to the lower, as a rule. The flexors are most prominently affected, and the hands and toes show most markedly the tetanic condition of the flexor muscles. The muscles are hard and firm, and remain so while the attack lasts, which may be for a few minutes or a few hours. Sensation and mental functions as a rule are not impaired. When the attack has passed away the patient feels comparatively well, except that the peripheral nerves are very sensitive to electrical and mechanical stimulation. The frequency of the attacks varies in different cases. Trousseau has demonstrated that a new paroxysm can be brought on by pressure on the larger arteries and nerves.

What are the prognosis, diagnosis, and treatment of tetany?

The *prognosis* is favorable, and the paroxysms, after lasting for a few weeks, gradually cease. Ergotine in poisonous doses may give symptoms of tetany.

Galvanic electricity is of great benefit. Internally, sedatives may be used.

TETANUS.

What is tetanus?

Persistent, involuntary, and painful contractions of various groups of voluntary muscles; the paroxysm may yield in intensity in one group, while continued in others.

What are the etiology and pathology of tetanus?

It is more common in the tropics than in moderate climates, and occasionally appears as an epidemic. It may follow exposure to cold or injury. Occasionally infants are attacked by tetanus. The affection is believed to be due to a specific micro-organism.

What are the symptoms of tetanus?

There may be prodromata of headache and malaise, especially in cases following exposure to cold. After a few days, or, in traumatic cases, after a few weeks, the muscles of the face, jaw, and neck become rigid, the stiffness extending to the muscles of the back and abdomen. The patient is unable to open the mouth on account of the trismus of the masseters; the whole body is in a position of opisthotonos, but the arms may remain freely movable. Occasionally there are exacerbations of the paroxysm, during which the affected muscles become still more tense. Sensation as a rule is normal, but the rigid muscles cause a great deal of

pain. The cutaneous reflexes are increased. The stiffness of the thoracic muscles may cause dyspnœa, and, expectoration being difficult, there may be an accumulation of mucus, causing subsequently pneumonia. The pulse is small and rapid; the temperature soon becomes elevated, and remains high after death. The intellect remains clear throughout the disease. In the mild forms the paroxysms are slight, of short duration, and may go on to recovery. Severe cases are rapidly followed by death from inability of the patient to take proper nourishment and from respiratory difficulties. Occasionally tetanus attacks only the muscles of the face and head, and is combined with spasms of the pharynx and œsophagus.

What are the diagnosis and treatment of tetanus?

Strychnine-poisoning, acute meningitis, and hydrophobia may all produce symptoms resembling tetanus.

If the affection follows exposure to cold, large doses of the salicylates may be employed. Narcotics and sedatives may allay the severity of the spasm. Curare has sometimes been used with good results. Rest and a liquid nourishment are essential. In traumatic cases great care should be given to the injury.

ATHETOSIS.

This is an involuntary movement of a group of muscles, due to an irritation of the motor-centres. The movements may be in any set of muscles, but most commonly affect the hand, the fingers being constantly separated, extended, flexed, and approximated. These movements increase in rapidity with mental excitement. Their exact causation is unknown, but they may complicate some of the general nervous diseases, as epilepsy, hemiplegia, etc.

HYSTERIA.

What is hysteria?

A complex disturbance of all the cerebral functions of a chronic nature, and not dependent upon any visible anatomical derangement, but intimately associated with psychical exciting causes.

What is the etiology of hysteria?

Females after the age of puberty are much more frequently attacked by hysteria than males. Violent emotions of a sudden or protracted nature are chief causes for the development of hysteria, especially in those of a neurotic nature. It is often hereditary in some families, and anything tending to weaken the nervous system is instrumental in the production of hysteria. Diseases of the female sexual organs, by depressing the spirits of a woman, often cause the development of this affection.

What are the symptoms of hysteria?

The appearance and behavior of hysterical persons often betray their malady. They are irritable, emotional, and subject to extreme expression of their feelings. Their will-power is weak, but they are often talented and persons of genius. They are usually of a weak constitution, and are always complaining of all kinds of aches and ills. In the worst cases emotional disturbances are often followed by convulsions resembling epilepsy ("hystero-epilepsy"), but consciousness is not completely lost, sensation is not abolished, and the movements are much more elaborate than in true epilepsy. The convulsions may be confined to the muscles of respiration or to an isolated group or to a single muscle. The patient may have fits of crying or laughing, or of a constriction of the œsophagus or pharynx. The attacks may last from a few minutes to a few days. Violent emotions may also be followed by paralysis of the voluntary muscles, dependent on an inhibition of the will-power to move the affected part. The lower extremities are most often attacked, and rigid contracture of the muscles may follow. Sudden aphonia, from paralysis of the vocal cords, has been noticed in many cases. Some patients exhibit a complete or partial anæsthesia, but hemianæsthesia is characteristic of most cases of hysteria. The skin, mucous membrane, and the deeper structures on the affected side all show a complete anæsthesia, as do the organs of special sense situated on the same side, and the muscular sense on this side is also in abeyance. In some cases, instead of anæsthesia or in conjunction with it, there is a great deal of hyperæsthesia and pain in certain parts of the body. The ovaries are very sensitive to pressure, as are several of the vertebræ and some parts of the cranium. Vasomotor disturbances in the superficial or deep structures are often observed. The stomach may be the seat of nervous affections, and hemorrhages from various parts of the body may cause some apprehension. Swallowing of air may produce symptoms of peritonitis or a tumor, but under an anæsthetic these symptoms vanish. There are disturbances of the sexual function and of the urinary secretion. Hysterical angina may also follow mental emotions.

In the most pronounced cases ("grande hysterie") the attacks of hysteria begin with epileptiform convulsions, and are followed by peculiar contortions and a great variety of "attitudes of passion." Delirium and hallucinations may follow these attacks. Hysterical subjects are also brought with great ease under hypnotic influences.

The different cases display the greatest variety of manifestation regarding the severity of the symptoms, and no two cases are identically alike in their appearance.

What are the prognosis, diagnosis, and treatment of hysteria?

Some cases recover permanently, but most patients show a tendency to relapse.

A great many organic and other diseases may be simulated by hysteria, and only experience can aid in making a differential diagnosis.

The prophylaxis consists of a proper bringing up of a child displaying hysterical tendencies. Hysteria must be treated as a disease, and attention should be paid to every symptom, as indifference on the part of the physician will render the patient worse. The patient must be removed from all exciting influences and moral treatment should be adopted. In cases of paralysis the affected part should be well exercised and the will-power of the patient strengthened. Electricity and massage, with cold sponging, are good adjuvants. Contractures may be remedied by thorough massage and constant exercise of the parts. In aphonia strong electric shocks to the vocal cords often bring back the voice. During the convulsion the patient should be put in the horizontal position, and a good drenching with very cold water will probably bring him back to a normal condition. The anæsthetic parts should be stroked with the faradic brush. In cases with general hysterical symptoms nerve-tonics and moral influence should be applied. A good many remedies have been recommended for internal use. Valerian, bromides, asafœtida, and many other things have been used with varying results. If an organic disease be at the foundation of the affection, we must endeavor to remedy that.

NEURASTHENIA.

What is neurasthenia?

Nervous exhaustion, due to an impaired vigor of the brain or spinal cord, or of both.

What is the etiology of neurasthenia?

Any influence weakening the central nervous system is apt to produce neurasthenia. In people with neurotic tendencies sexual abuse, mental overwork, and anxiety may produce neurasthenia.

What are the symptoms of neurasthenia?

The patient complains of a constant feeling of pressure in his head, associated sometimes with hyperæsthesia and pain. Mental work cannot be performed with ease; the patient is troubled with insomnia, and cannot pursue his former occupation with the same facility. He is easily exhausted by any muscular exertion, and from lack of exercise appetite is lost and constipation is apt to follow. There may be vague pains all over the body, and if the patient has a hypochondriacal nature he soon avoids the society of others, and in brooding over himself gradually grows worse.

What are the prognosis, diagnosis, and treatment of neurasthenia?

It is never fatal, and complete recovery may take place, but relapses are very common.

Hysteria and grave cerebral affections may resemble neurasthenia. In

hypochondriacal patients a sympathetic assurance that improvement is taking place often restores health.

Diet is very important. Obese people should be reduced, thin people fattened. Stimulants must be interdicted as well as all mental work. Electricity, massage, passive or active movements, baths, and douches are very beneficial. Internally, tonics should be given. Narcotics should be avoided, and the insomnia is best treated by improvement of the general health.

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